

RORZE

RORZE CATALOG



CONTROLLERS
DRIVERS
STEPPING MOTORS

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RC-002	RC-003	RC-004
Option connectors for wiring		

Stepping Motor Drivers RD series

Selection table

2-PH Stepping Motor Drivers

Pulse Input Drivers	RD-022A/022NA	RD-023A/023NA	RD-021M8
	RD-023MS	RD-023MSH	RD-026MSA
	RD-023MB	RD-026MB	
Drivers with built-in pulse oscillator	RD-122A	RD-123A/126A	
	RD-323A/326A	RD-323MS	
	RD-323M10(M50)HA/RD-326M10(M50)A		

5-PH Stepping Motor Drivers

Pulse Input Drivers	RD-053A/053NA	RD-053MS	RD-A051
Drivers with built-in pulse oscillator	RD-153A	RD-353A	

Stepping Motors RM series

Motor Specifications

2-PH Stepping Motors

RM2C5648-30S/D	RM2C5675-60S/D
RM2414S/D	RM2424S/D
RM2621S/D	RM2640S/D
RM2690S/D	RM26A3S/D
RM29A3S/D	RM29B2S/D

5-PH Stepping Motors

RM5407SM/DM	RM5411SM/DM
RM5414SM/DM	RM5623S/D
RM5640S/D	RM5685S/D
RM59A2S/D	RM59B2S/D
RM59D0S/D	
Recommended Damper	

Productions to be discontinued

Masternet Control System

Masternet control system is a system to make a control system for central or remote control via a main controller such as personal computer with RS-232C, etc.

Because the system runs as a fully-distributed control system and each unit is light and compact, it can be mounted near motors and sensors. Additionally, the number of wiring is much less because only two cables (power and signal) are required.

These features allow you to:

- (1) Start-up the system quickly.
- (2) Reduce wire disconnection problems.
- (3) Save time in exchanging modules in the case of a problem.

Individual subsystems are formed by the following four product lines.

1. Current Adapter, the Link Master RC-002 and RC-400 which provides the communication between PC and controllers.
2. Controllers with general I/O ports such as RC-204A, RC-207A, RC-234, RC-410 and RC-420 which can be controlled by the communication.
3. Compact stepping motor drivers (RD series) which can be mounted right near motors.
4. 2-ph/5-ph stepping motors (RM series) which are optimized to the specification of RORZE driver.

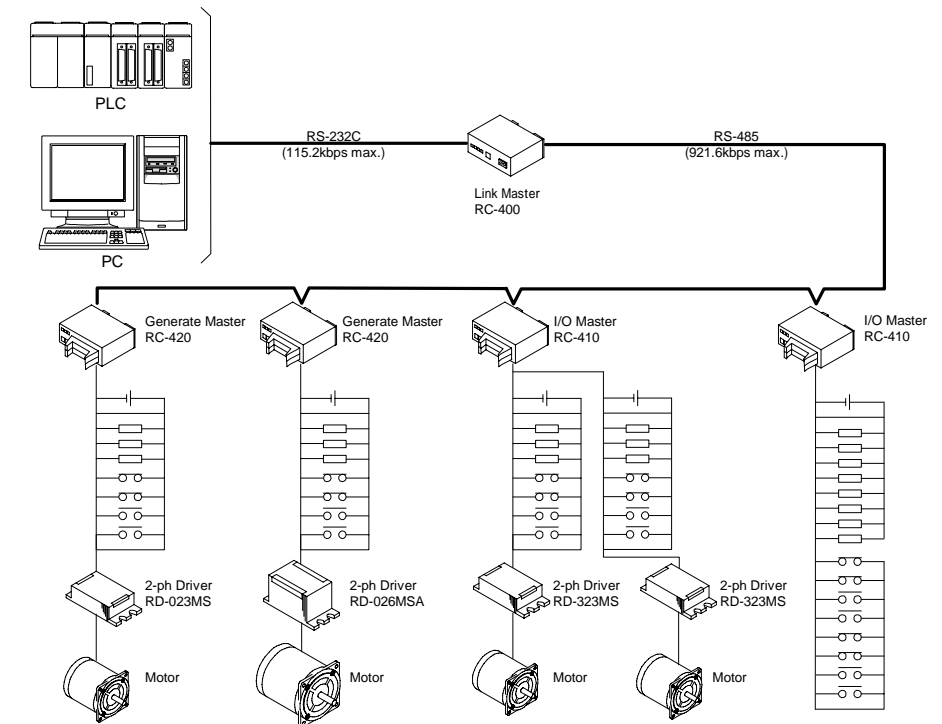
Features

- Because each controller is originally controlled by the commands received by the communication, the easy program from PC can provide the high level control.
- Operation software can be written in any high level language which can control RS-232C communication.
- Compact steel casings and simple wiring will make the system compact and provide free configurations.
- Because easy unit operates with DC power supply, it can built into autonomy robots.
- Modular systems make the time for development of devices shorter and the system easy to diagnose and repair.
- Can make a network system with one Link Master and two (RC-400 series) or three (RC-200 series) cables and subsystems can be controlled from a control station up to 1.2 km(1) away. RC-400 series can control up to 120 controllers and RC-200 series can control up to 20 controllers.

- 1 In RC-200 series, the distance which can be communicated varies depending on the number of connected controllers or the communication speed etc.

System Configuration

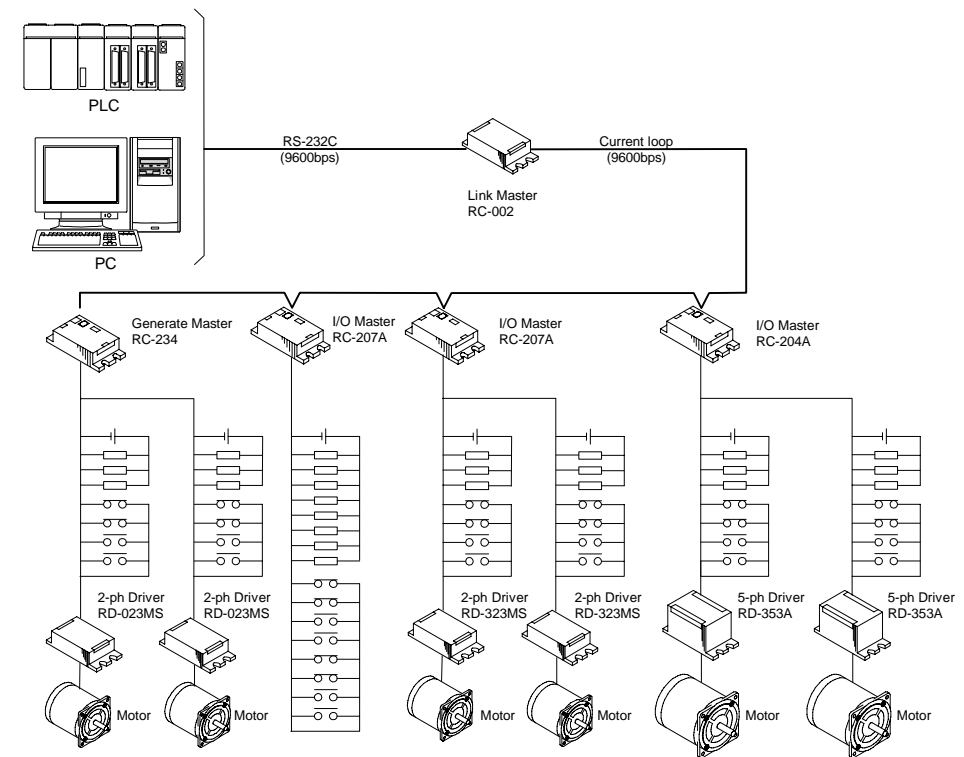
The configlation which used RC-400 series



• Polling is unnecessary

Link Master RC-400 monitoring each controller by high speed RS-485 (921.6kbps max.) lightens the burden imposed on the host PC. (Automatic polling function) Also, communication speed between a host PC and a RC-400 has become about 10 times faster than before. (115.2kbps max.)

The configlation which used RC-200 series

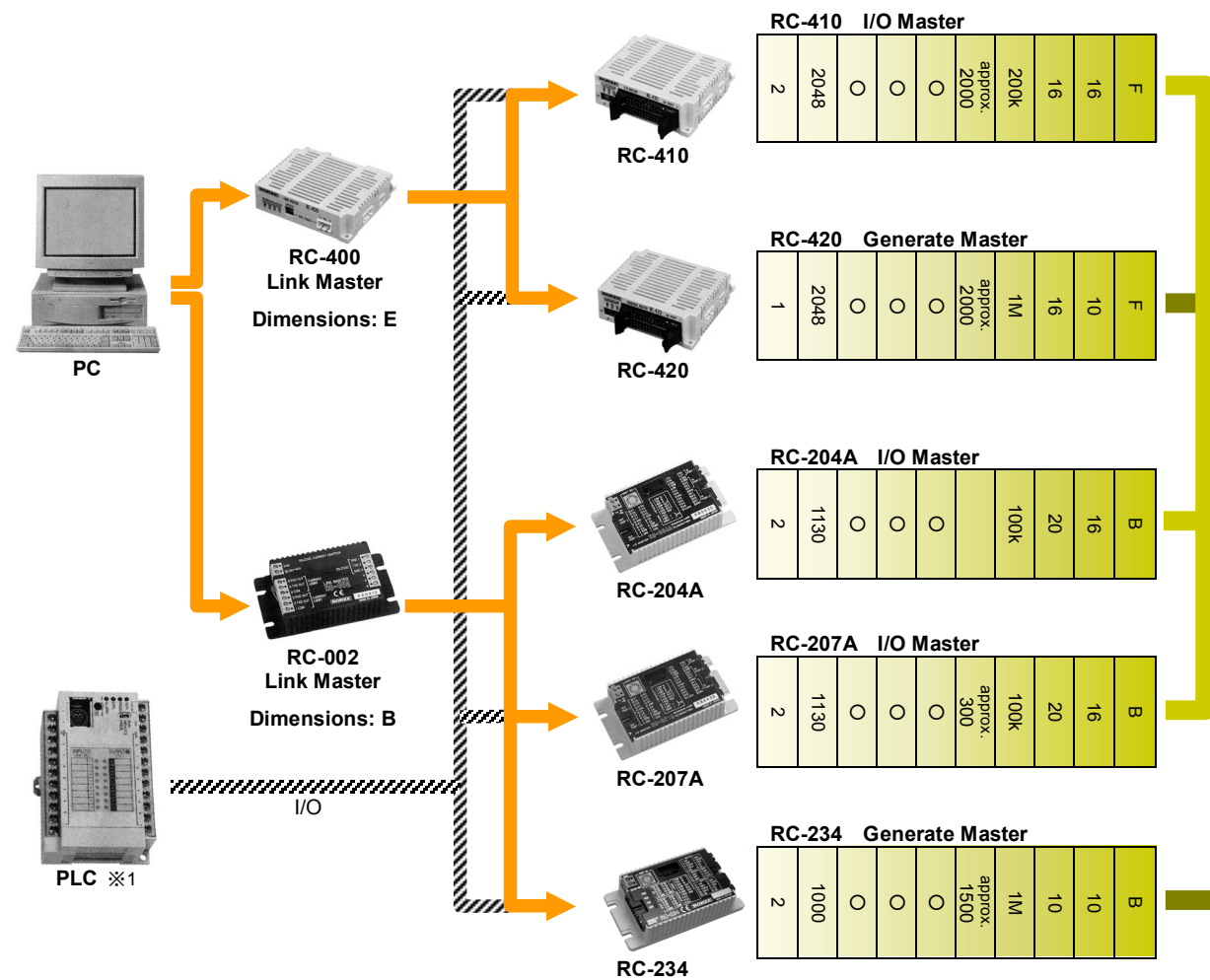


Controller, driver & stepping motor system configuration

Outside Dimensions	
※4 Output Ports	
※4 Input Ports	
Maximum Pulse Rate (pps)	
User Program Memory Capacity (No. of command)	
※3 Stall Detection Function	
Pulse Movement Method	Incremental Absolute
No. of Profiles	
※2 Control Motors (max)	

Drivers		RD series	
Motor Current (A/ph)	Excitation Method	Microstep Resolution (max)	
		Half Step	
		Full Step	
	Supply Voltage (VDC)		
	Maximum Pulse Rate (max) (pps)		
Grow Out Terminal			
Speed Change Function		Analog	
		Digital	
Outside Dimensions			

Stepping Motors				RM series			
2-ph Stepping Motors				5-ph Stepping Motors			
RM29B2S/D	2.2	1.8	6.0	RM59D0S/D	3.9	0.72	3.0
RM29A3S/D	1.3	1.8	6.0	RM59B2S/D	2.2	0.72	3.0
RM26A3S/D	1.3	1.8	3.0	RM59A2S/D	1.23	0.72	3.0
RM2690S/D	0.78	1.8	3.0	RM56B8S/D	0.83	0.72	3.0
RM2640S/D	0.39	1.8	3.0	RM56A0S/D	0.39	0.72	3.0
RM2621S/D	0.21	1.8	3.0	RM5323S/D	0.23	0.72	3.0
RM2424S/D	0.24	1.8	1.5	RM5414SM/DM	0.14	0.36	1.5
RM2414S/D	0.14	1.8	1.5	RM5411SM/DM	0.11	0.36	1.5
RM2C5675-60S/D	1.03	3.75	6.0	RM5407SM/DM	0.074	0.36	1.5
RM2C5648-30S/D	0.47	3.75	3.0				



※1 In case of controlling RC-207A, RC-234, RC-410 or RC-420 using PLC, some programs downloaded via PC in advance are selected and started by PLC.

※2 RC-410 and RC-234 can control two motors simultaneously.
RC-204A and RC-207A can control two motors alternately. It's impossible for them to work two motors together at the same time.

※3 The controllers with a stall detection function can detect stalls by attaching a stall slit (ON-OFF cycle is fixed) and a stall sensor to moving part. RC-420 and RC-234 can detect a stall by encoder as well.

※4 The number of I/O port varies depending on the number and kind of motor.

Outside Dimensions

A32(H) × 50(W) × 80(D)mm
B27.5(H) × 105(W) × 56(D)mm
C63(H) × 56(W) × 105(D)mm
D84(H) × 40(W) × 155(D)mm
E25(H) × 86(W) × 69(D)mm
F29.5(H) × 86(W) × 69(D)mm
G22.6(H) × 105(W) × 65.6(D)mm

Drivers with built-in pulse oscillator
RD-3** Series

[illegible]

Drivers with built-in pulse oscillator
RD-1** Series

[illegible]

Pulse Input Drivers RD-0** Series

[illegible]

Controllers to Control Stepping Motors and I/O Ports

RC-410

I/O MASTER



Description

RC-410 is an I/O controller which has 16 Input ports and 16 Output ports. This controller can control positioning of stepping motor using Rorze's original driver with built-in pulse oscillator. (S-curve acceleration/deceleration and interpolation control are not available.)

Features

- 16 Input ports and 16 Output ports for general purpose can make system control easy.
- Can control 2 motors simultaneously.
- Stall detection of stepping motor using a STALL sensor.
- Stand-alone operation and control from PLC is available by downloading the user program.
- Isolated communication ports, inputs and outputs by photo-coupler
- Light and compact (120g, 29.5 x 86 x 69mm) and DIN rail installation is available.

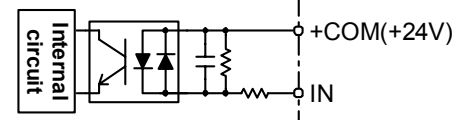
Specifications

Supply voltage	18 to 36VDC (including ripple)
Supply current	Less than 200mA (at 24VDC)
Clock response	200kpps max.
Data memory position	-999,999,999 to +999,999,999
Number of profiles	2,048 (each axis)
Input ports Output ports	16 (Including I/O ports to control motors) 16
Acceleration/deceleration method	Trapezoidal
Stall detection method	STALL sensor
Communication method	RS-485 (921.6kbps max.) Distance: 1.2km max. (use Link Master RC-400)
User program	6,039steps (approx. 2,000commands)
Recommended drivers	Drivers with built-in oscillator (RD-100 and 300 series)
Control motors	2 (Synchronized motion of the 2 axes is available.)
Outside dimensions	29.5(H) × 86(W) × 69(D)mm
Weight	approx. 120g

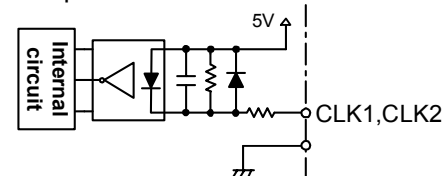
Input/Output ports

Input port

Sensor, General-purpose Inputs

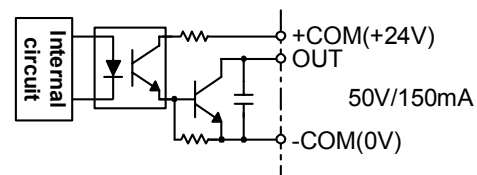


Pulse Inputs



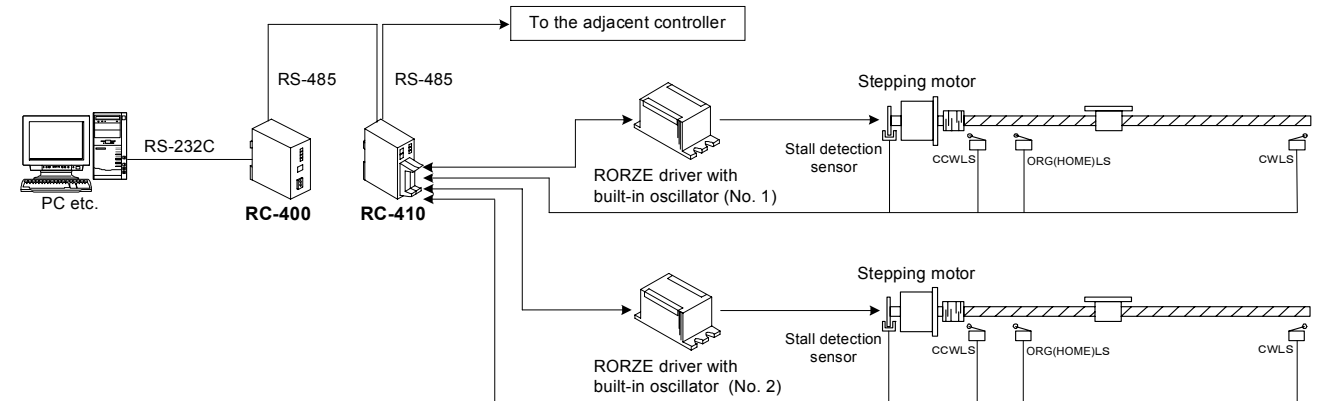
Output port

General-purpose Outputs



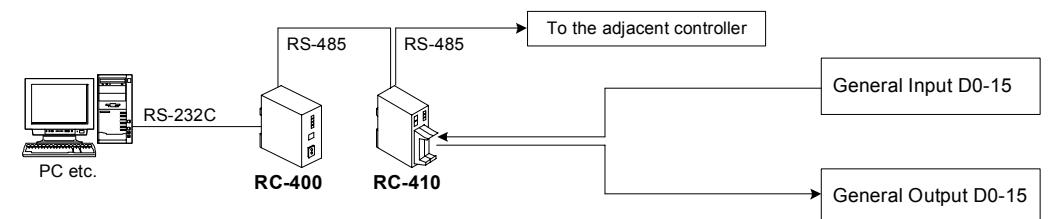
System configurations

Example 1 (Controlling two drivers)



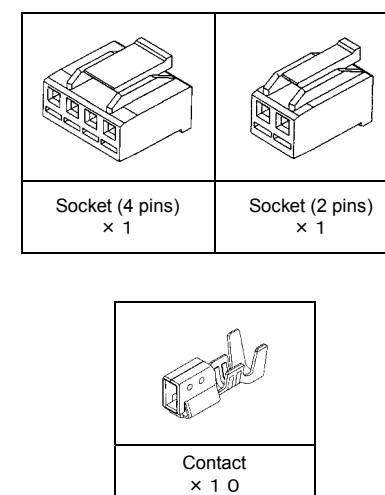
- By using a RC-410, two stepping motors can be controlled simultaneously.
- Stall detection of stepping motors is available by connecting stall detection sensor to RC-410
- When using a RD-100 series driver, a low step pulse (pulses in deceleration period) needs to be set up in advance. A RD-300 series driver has a "GROW OUT" terminal that outputs a signal during acceleration. A RD-410 counts the number of pulses while receiving this signal, and automatically calculates a low step pulse to perform deceleration.

Example 2 (All of the I/O ports are used as general purpose ports)

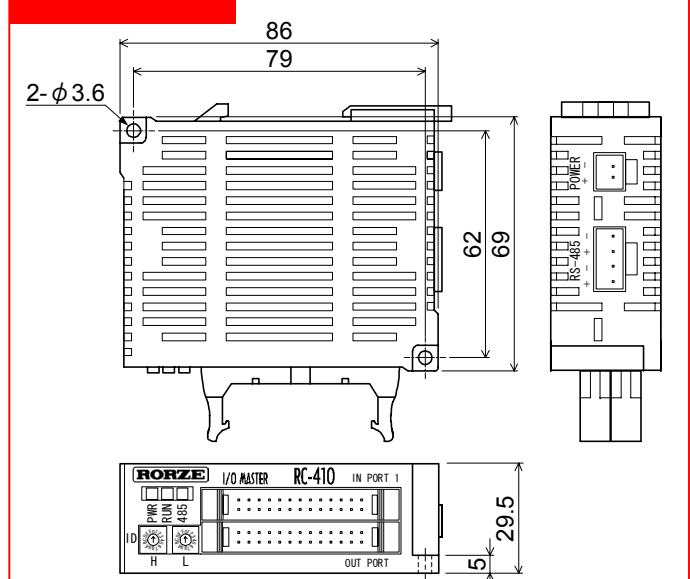


All of the I/O ports (16 points) can be used for any purpose (in this mode).

Accessories



Dimensions



Motion Controller
with Multi-axis Interpolation Control

RC-420

Generate Master



Description

RC-420 is a motion controller which can control stepping motor and servo motor by pulse input.
Thanks to the high-speed CPU, various acceleration/deceleration patterns of pulse generation are available by utilizing software.
Also, using with RC-400 allows synchronized motion by plural controllers.
Combining these functions provides you a multi-axis interpolation control by plural RC-420s.

Features

- Circular and linear interpolation control in a SCARA robot are available by using plural RC-420s.
- Can combine S-curve acceleration/deceleration having various parameters flexibly
- Closed loop control when used with an encoder for accurate positioning.
- Stand-alone operation and control from PLC are available by downloading the user program.
- Isolated communication ports, inputs and outputs by photo-coupler
- Light and compact (120g, 29.5 x 86 x 69mm) and DIN rail installation is available.

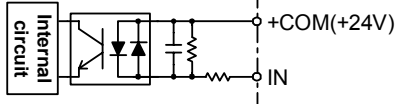
Specifications

Supply voltage	18 to 36VDC (including ripple)
Supply current	Less than 200mA (at 24VDC)
Pulse rate	1pps to 1Mpps
Data memory position	-999,999,999 to +999,999,999
Number of profiles	2,048
Input ports	10
Output ports	16
Acceleration/deceleration method	Arbitrary S-curve, Trapezoidal
Interpolation function	2-axis circular / linear interpolation in a SCARA robot
Stall detection method	Encoder or STALL sensor
Communication method	RS-485 (921.6kbps max.) Distance: 1.2km max. (use Link Master RC-400)
User program	6,039steps (approx. 2,000commands)
Recommended drivers	Pulse Input Drivers (RD-0 series)
Control motor	1
Outside dimensions	29.5(H) × 86(W) × 69(D)mm
Weight	approx. 120g

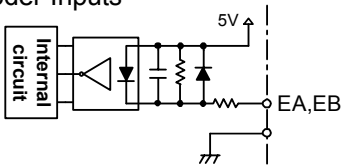
Input/Output ports

Input port

Sensor, General-purpose Inputs

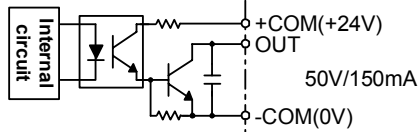


Encoder Inputs

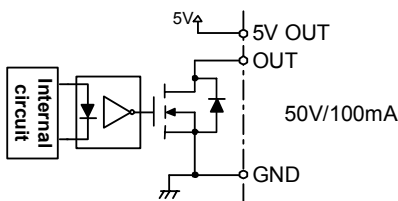


Output port

General-purpose Outputs

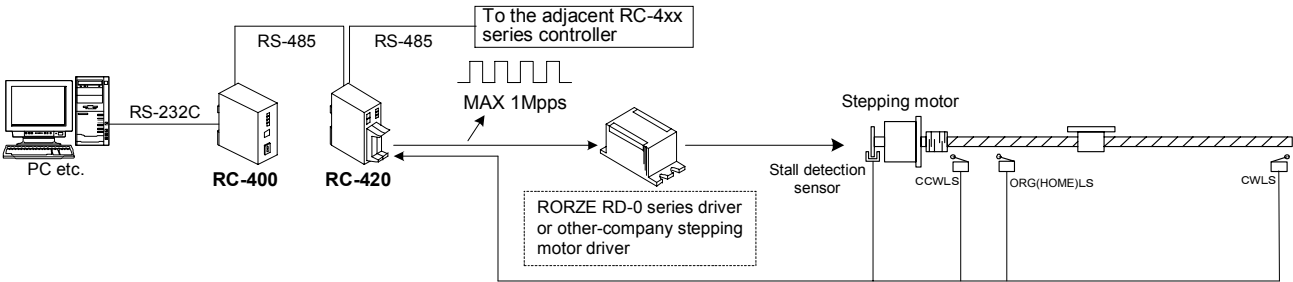


Pulse Outputs



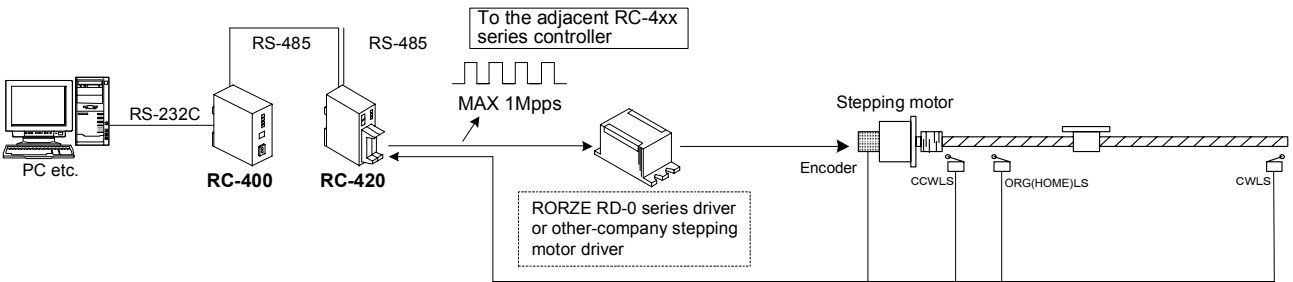
Mode Selections

1. Controlling a stepping motor driver



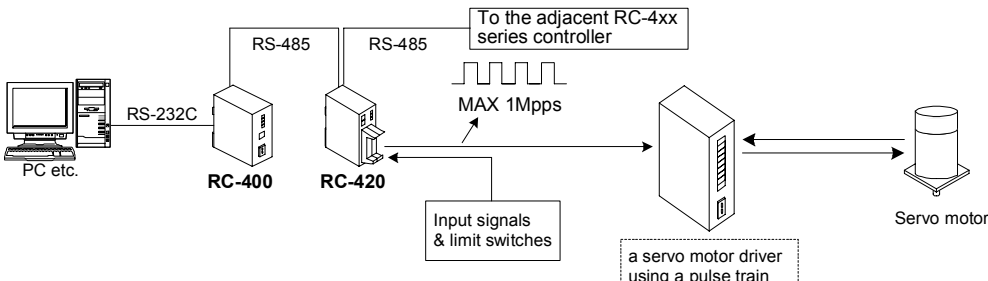
Stall detection of stepping motors is available by connecting stall detection sensor to RC-420.

2. Controlling a stepping motor driver with an encoder input



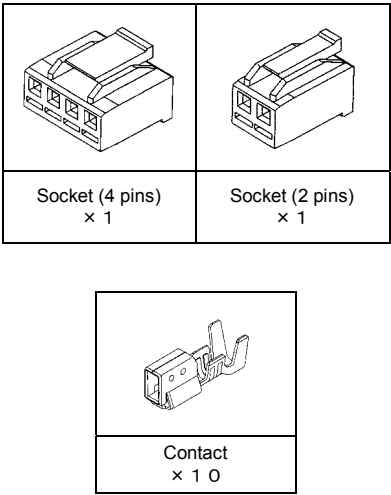
Mode to control a stepping motor on the basis of the pulse put out from an incremental type encoder.
This mode is effective when accurate positioning is required.

3. Controlling a servo motor driver using a pulse train

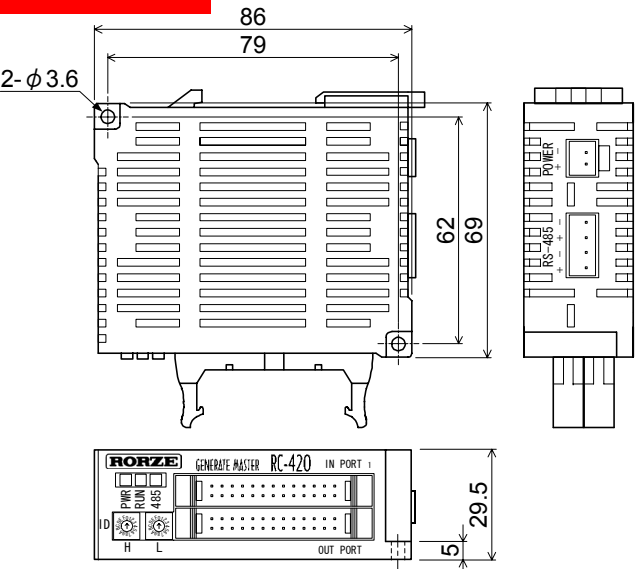


Mode to control a servo motor by connecting with a pulse input servo motor driver.

Accessories

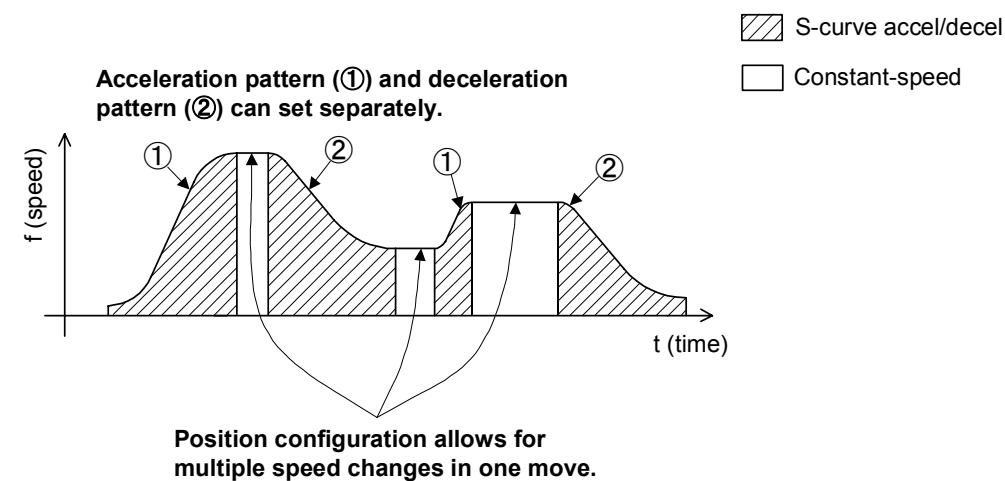


Dimensions



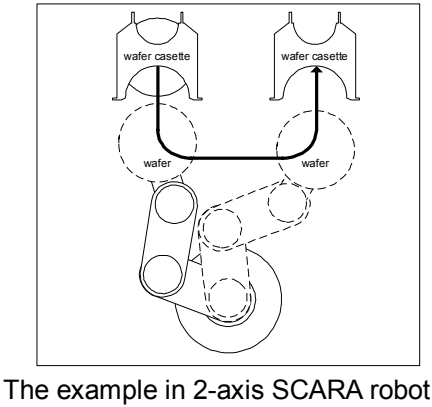
Acceleration/Deceleration pattern

Accel/decel pattern in RC-420



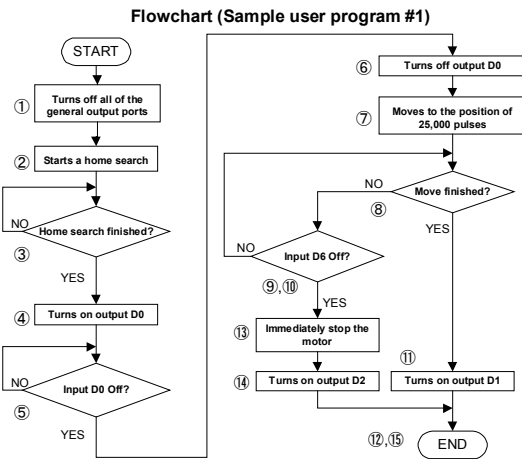
Multi-axis interpolation control

Can configure more complex paths by combining circular and linear interpolation by XY coordinate system in 2 or 3-axis SCARA robot



Sample of user program

Address	Command	Description (No. in the flowchart below)
0	COS H0	Turns off all of the general output ports. (①)
1	00M	Performs a home search. (②)
2	JON MT,+0	Repeats address 2 if motor is moving. Proceeds to the next command after the home search is completed. (③)
3	SET OD0	Turns on general output D0. This informs an external circuit that a home search is finished. (④)
4	JOF ID0,+0	Repeats address 4 if general input D0 is off. Proceeds to the next command when the port is turned on (1). (⑤)
5	RST OD0	Turns off general output D0. (⑥)
6	1AM1,25000	Starts to run motor at a high speed toward the position of 25,000 pulses. (⑦)
7	JOF MT,+3	Jumps to the 3rd next address (i.e. address 10) if the motor is stopped. (⑧)
8	JOF ID6,+4	Jumps to address 12 if general input D6 is off (while the motor is running). (⑨)
9	JMP -2	Jumps to the 2nd previous address (i.e. address 7). (⑩)
10	SET OD1	Turns on general output D1. This informs an external circuit that a move is finished. (⑪)
11	END	Exits the user program. (The next address is not executed.) (⑫)
12	5IS	Stops the motor immediately. (⑬)
13	SET OD2	Turns on general output D2. This informs an external circuit that the move is aborted. (⑭)
14	END	Exits the user program. (⑮)



Compact
Light
Communication Adapter
RC-400
LINK MASTER



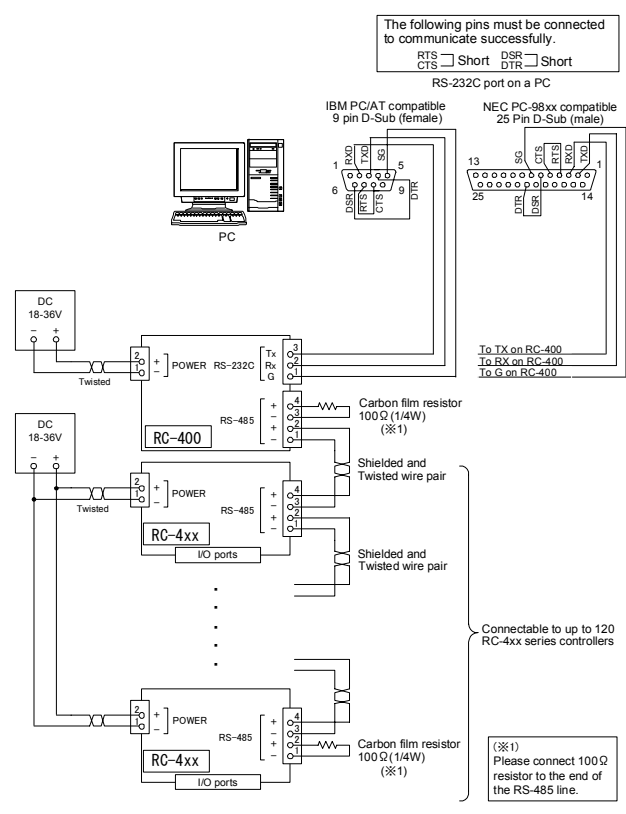
Description

RC-400 controls a communication among a host, RC-410s and RC-420s. Also, a multi-axis interpolation control is available by using with RC-420.

Features

- Monitoring each controller all the time lightens the burden imposed on a host PC. (Automatic polling function)
- High speed communication
between host PC and RC-400: Up to 115.2kbps
between controllers: Up to 921.6kbps
- Can control up to 120 RC-4xx series controllers by a RC-400.
- Communication distance is extensible up to 1.2km.
- Light and compact (90g, 25 x 86 x 69mm) and DIN rail installation is available.

Wiring a power and communication line



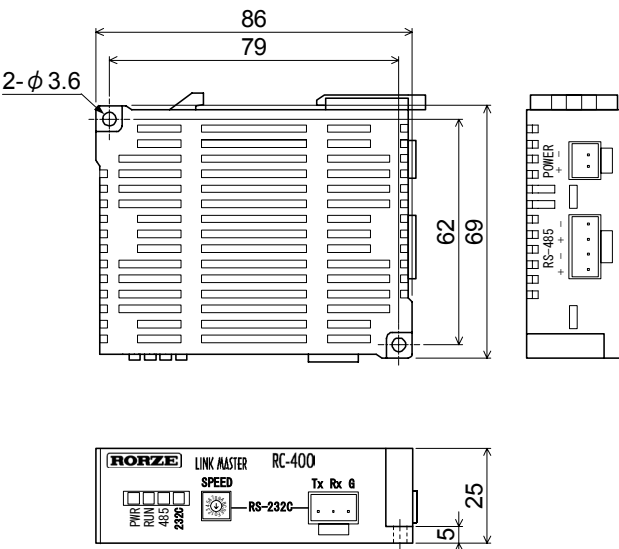
Accessories

Socket (4 pins) x 1	Socket (3 pins) x 1	Socket (2 pins) x 1	Contact x 14	Resistor x 3

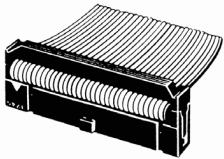

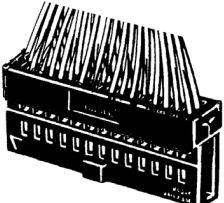

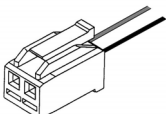
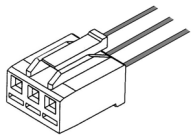
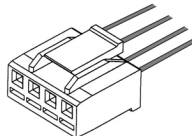
Specifications

Supply voltage	18 to 36VDC (including ripple)
Supply current	100mA (at 24VDC)
Communication with PC	RS-232C (115.2kbps max.)
Communication with RC-400 series	RS-485 (921.6kbps max.) Distance: 1.2km max.
Max. connected devices	120 units
Outside dimensions	25(H) × 86(W) × 69(D)mm
Weight	approx. 90g


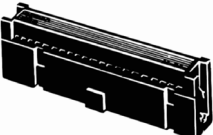


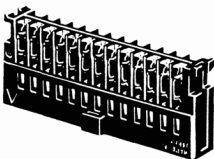

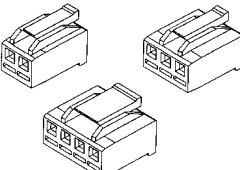

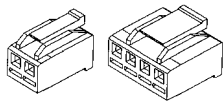


Dimensions



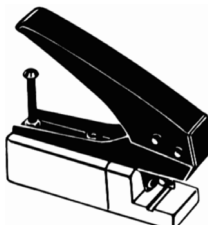



Option connectors for wiring

I/O Cables		Power Supply Cable	Communication Cables	
Socket with flat cable Model : RCC-26P□□□LC Length (cm) : 50, 100, 200, 300  Flat cable (26 conductors) with a single-sided socket × 1  Coding pin × 1	Socket with discrete wires Model : RCB-26P□□□LC Length (cm) : 50, 100, 200, 300  Discrete wire (AWG#24, BLUE, 26 pcs.) with a single-sided socket × 1  Coding pin × 1	Socket with discrete wires (for Power Supply) Model : RCM-2P□□□L Length (cm) : 50, 100, 200, 300  Discrete wire (AWG#20, BLACK, ORANGE, each 1 pc.) with a single-sided MOLEX socket (2 pins) × 1	Socket with discrete wires (for RS-232C) Model : RCM-3P□□□L Length (cm) : 50, 100, 200, 300  Discrete wire (AWG#24, BLUE, 3 pcs.) with a single-sided MOLEX socket (3 pins) × 1	Socket with discrete wires (for RS-485) Model : RCM-4P□□□L Length (cm) : 50, 100, 200, 300  Discrete wire (AWG#24, BLUE, 4 pcs.) with a single-sided MOLEX socket (4 pins) × 1

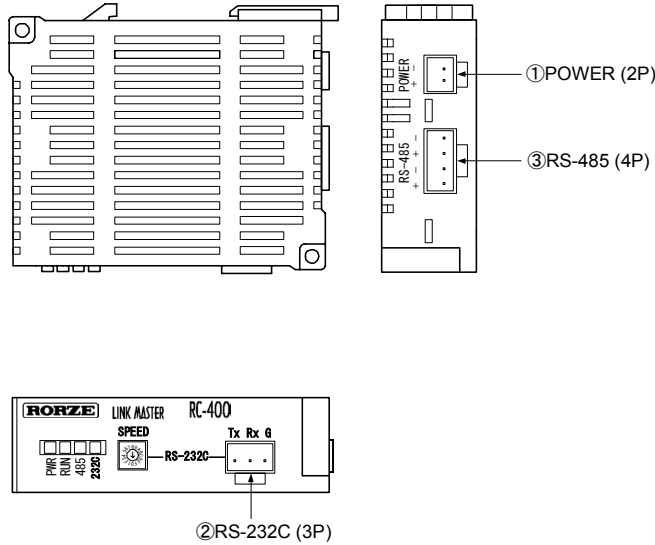
※The coding pin is used to prevent confusion when many connectors with the same number of contacts are lined up.

Connectors		Repair parts		
Socket for flat cable Model : RCF-26PC  Strain relief × 1  Socket × 1  Coding pin × 1	Socket for discrete wires (for AWG#24) Model : RCR-26PC  Semi cover × 2  Socket × 1  Coding pin × 1	Accessories for RC-400 Model : RC4-ACC1  MOLEX socket (2·3·4 pins) each 1 pc.  Contact × 1 4 Carbon film resistor 100Ω (1/4W) × 3	Accessories for RC-410, 420 Model : RC4-ACC2  MOLEX socket (2·4 pins) each 1 pc.  Contact × 1 0	Contact for MOLEX socket Model : RC4-ACC3  Contact × 5 0

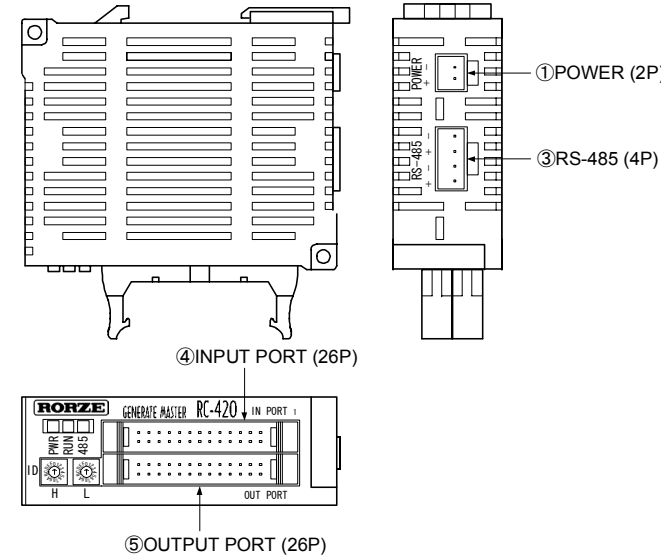
Tools			Attachment
Hand Crimper for MOLEX connectors Model : TOOL-57189-5000 Necessary when connecting MOLEX sockets with discrete-wires. 	Hand Crimper for flat-cable connectors Model : TOOL-901500 Necessary when connecting sockets with flat-cable. 	Hand Crimper for discrete-wire connectors Model : TOOL-XY2B-7006 Necessary when connecting sockets with discrete-wires. 	Spacer for DIN rail Model : AESC-SA-406B This is used when RC-4 series controllers are installed on a DIN rail at intervals of 5mm. 

Sockets used for each controller

RC-400







RC-410, RC-420

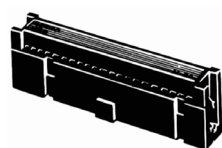

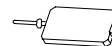
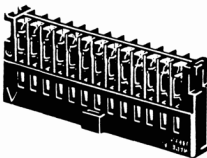



Suitable connectors

①,②,③ (Manufactured by MOLEX)

Sockets ①: 51067-0200 (for 2P) ②: 51067-0300 (for 3P) ③: 51067-0400 (for 4P)   	Contact 50217-8100 
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④,⑤ (Manufactured by OMRON)

For Flat cable Socket XG4M-2630 (for 26P)  Strain relief XG4T-2604 (for 26P)  Coding pin XG4Z-0005 	For Discrete wire Sockets for AWG#28 to 26 XG5M-2635 (for 26P) for AWG#24 XG5M-2632 (for 26P)  Semicover XG5S-1301 (for 26P) 
--	---

Compact
Low cost

Controllers to Control Stepping Motors and I/O Ports

RC-204A, RC-207A

I/O MASTER



Description

I/O Master RC-204A and RC-207A utilize serial communication (RS-232C) to control step motor drivers and I/O ports. Also, because a pulse counter is built in, trapezoidal acceleration is available by combining with RORZE's drivers with built-in pulse oscillator.

Features

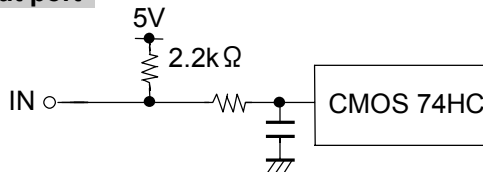
- In case of controlling no motor, all I/O ports can be used as general I/O ports.
- Stall detection by attaching a stall sensor and a stall slit to a device. (Note: Stall sensor devices may not be rotary in shape.)
- Up to 20 controllers such as RC-204A, RC-207A and RC-234 can be daisy-chained together in a MasterNet system from one PC and multi-axis stand-alone control is available at a low price. (See the example 2 in the system configuration.)
- RC-207A: EEPROM for easy downloading and saving the user's program
- RC-204A: Backup using battery (3.6V)

Specifications

Supply voltage		18 to 40VDC (including ripple)
Supply current		Less than 30mA (at 24VDC)
Clock response		100kpps max. 80kpps (at stall detection)
Data memory	RC-204A	0 to 16,777,215 pulses
position	RC-207A	0 to 16,777,215 pulses or -8,388,608 to +8,388,607
Number of profiles		1,130
Accel./Decel. method		Trapezoidal
Input ports Output ports		20 (Including I/O ports to 16 control motors)
Stall detection method		STALL sensor
Control signal line		Current loop method of RS232C (use Link Master RC-002)
Communication	RC-204A	9600 bps
speed	RC-207A	9600, 1200, 300 bps
Back up method		RC-204A: battery RC-207A: EEPROM
User program (RC-207A)		1,792 bytes (approx. 300 commands)
Recommended drivers		Drivers with built-in pulse oscillator (RD-100 and 300 series)
Control motors		2 of each, controlled alternately
Outside dimensions		27.5(H) × 105(W) × 56(D)mm
Weight		approx. 250g

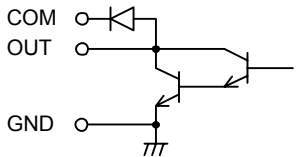
Input/Output ports

Input port



Low Level : Less than 1.5V
High Level: More than 3.5V

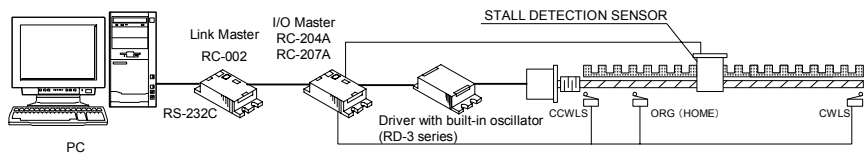
Output port



Open Collector (Darlington Transistor)
Voltage: Less than 50V
Current: Less than 200mA (per one contact)
Less than 800mA in total of 8 contacts
Vce(sat): Less than 1.1V (Ic : 200mA)

System configurations

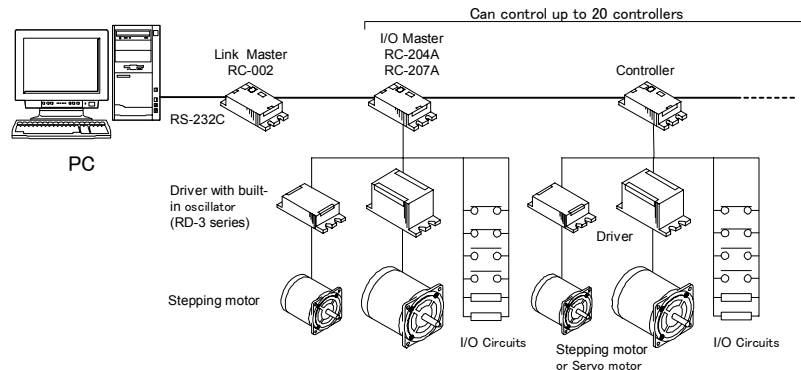
Example 1



Stall detection is possible, in case of using two motors.

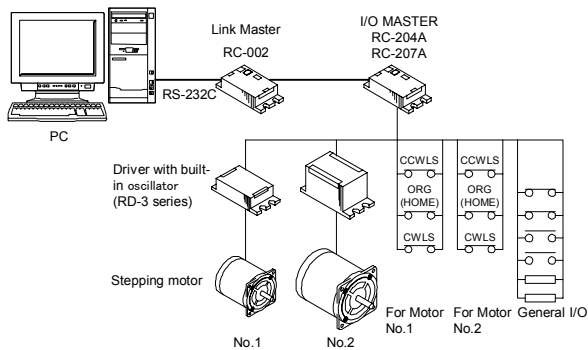
Stall detection of stepping motors is available by connecting stall detection sensor to RC-204A, 207A

Example 2



Controllers that can connect at this configuration: RC-204A, RC-207A, RC-234, RC-003

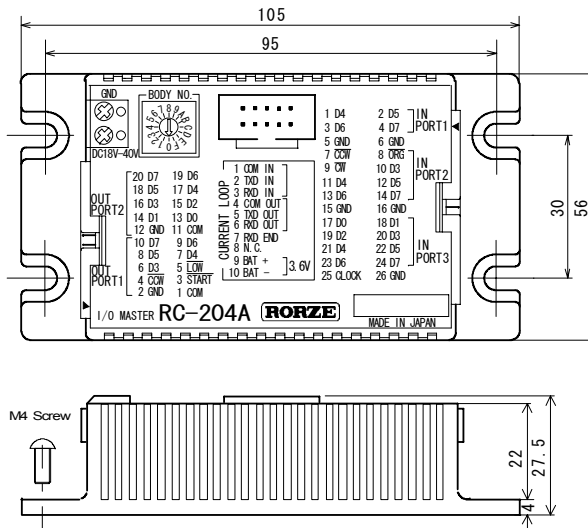
Example 3



Relation between No. of motor and general I/O ports.

No. of motor to control	0	1	2
General input ports	20	16	13
General output ports	16	13	10

Dimensions



Motion Controller with Two-axis Interpolation Control RC-234

GENERATE MASTER



Description

RC-234 is a motion controller which can control stepping motor and servo motor by pulse input. This can control 2 motors simultaneously, and circular and linear interpolation controls are available in the XY plane.

Features

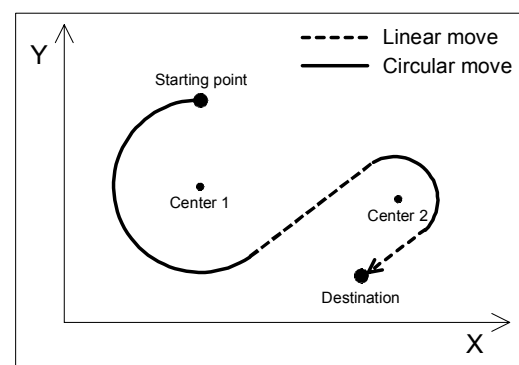
- Compliant with CE Marking.
- S-curve acceleration provides smooth moves without shock or damping.
- Closed loop control when used with an encoder for accurate positioning.
- Stand-alone operation and control from PLC are available by downloading the user program.
- Pulse output frequency up to 1Mpps permits to be used with a high resolution microstep driver.
- Up to 20 controllers such as RC-204A, RC-207A and RC-234 can be daisy-chained together in a MasterNet system from one PC and multi-axis stand-alone control is available at a low price.

Specifications

Supply voltage	18 to 40VDC (including ripple)
Supply current	Less than 100mA (at 24 VDC)
Pulse rate	0.1 to 1Mpps
Data memory position	0 to 16,777,215 pulses or -8,388,608 to +8,388,607
Number of profiles	1,000 (each axis)
Accel./Decel method	S-curve, Trapezoidal
Interpolation function	2-axis circular interpolation 2-axis linear interpolation
Input ports	10 (8 in a servo mode)
Output ports	10 (8 in a servo mode)
Stall detection method	Encoder or STALL sensor
Control signal line	Current loop method of RS232C (use Link Master RC-002)
Baud rate	38400, 19200, 9600, 2400, 1200, 300 bps
User program	8,000 bytes (approx. 1,500 commands)
Recommended drivers	Pulse Input Drivers (RD-0 series)
Control motors	2 (Synchronized motion of the 2 axes is available.)
Outside dimensions	27.5(H) × 105(W) × 56(D)mm
Weight	approx. 250g

Two-axis interpolation control

Circular and linear interpolation controls are available in the XY plane. Can configure more complex paths by combining circular and linear interpolation.



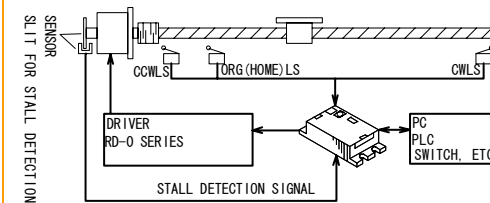
Speed change during a interpolation control.



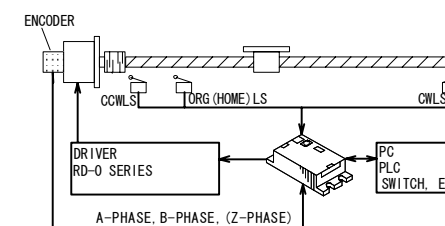
Mode Selections

You can step up the following modes arbitrarily to each axis.

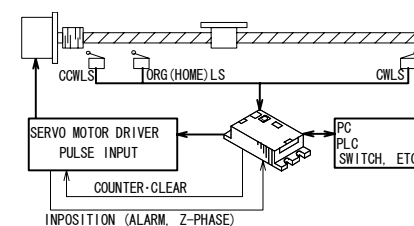
- 1. Controlling stepping motor using stall detection function**
If a stall is detected, a stepping motor stops immediately. Also, you can override a stall detection and control a stepping motor as usual.



- 2. Closed loop control of stepping motor using encoder**
Mode to control a stepping motor on the basis of the pulse put out from an incremental type encoder. This mode is effective when accurate positioning is required.



- 3. Servo motor control (Pulse input type driver)**
Mode to control a servo motor by connecting with a pulse input servo motor driver.



Sample of user program

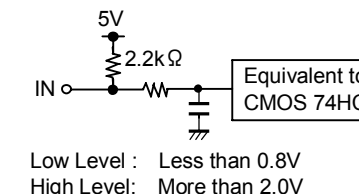
/22000/JON3+1/J-2/4//END
(" " is a separator between commands)

action: This program sets a position pulse number and when the input port D3 is turned ON, moves a motor by 2,000 pulses in the CCW direction (Command 4) and the user program is terminated.

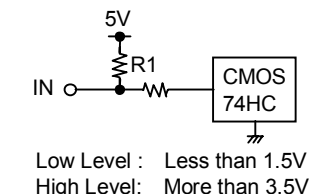
You can also use in the following stand alone mode: Once the user program is transferred to EEPROM and autostart is enabled, the controller will start the program automatically upon turning ON the power.

Input/Output ports

Input port

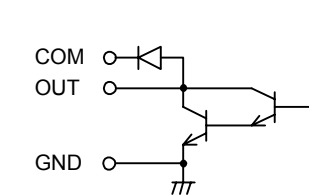


Input for motor control

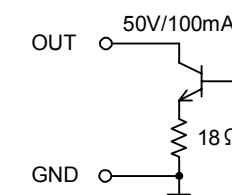


R1	470Ω (EA, EB) 2.2KΩ (Others)
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Output port



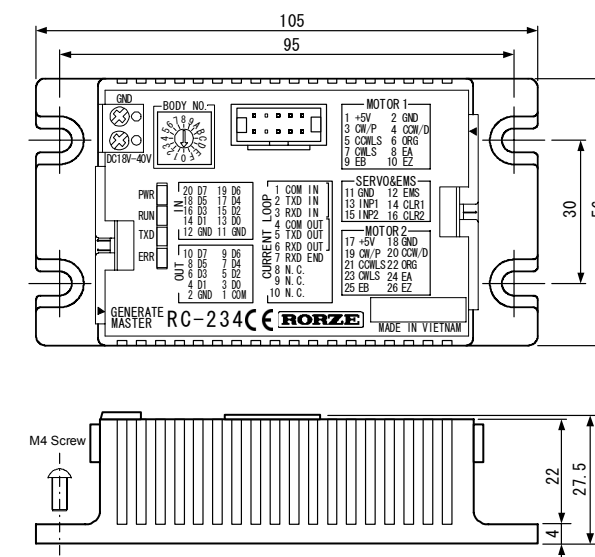
Output for motor control



Open Collector (Darlington Transistor)
Voltage: Less than 50V
Current: Less than 200mA (per one contact)
Less than 800mA in total of 8 contacts
Vce(sat): Less than 1.1V (Ic : 200mA)

Dimensions

(mm)



Adapter

RS-232C → Current loop

RC-002

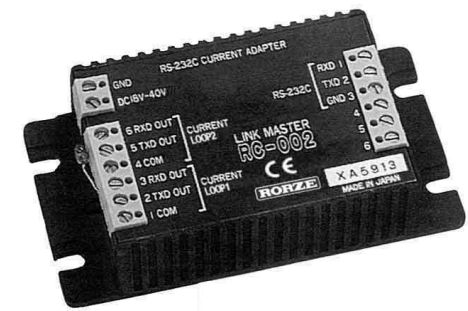
LINK MASTER

Description

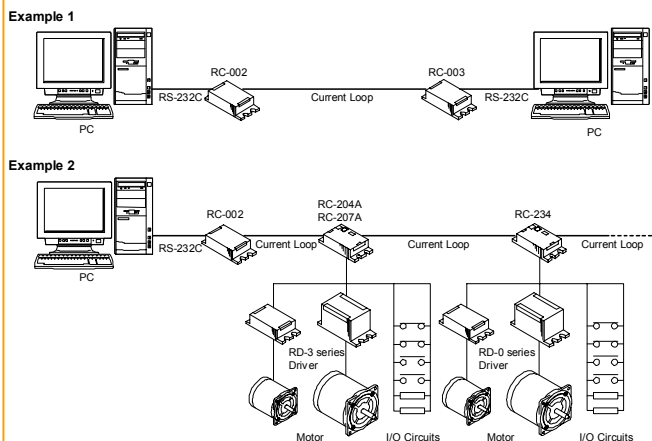
Link Master RC-002 converts the computer's RS-232C signal to current loop type.

Features

- Compliant with CE Marking.
- Communication by only 3 wires makes wiring and maintenance of device easy.
- Current loop transmission system improves the noise-resistant and long distance communication is available.
- With communication of the master slave system, the controller to 20 sets and RC-003 are connectable with one set of RC-002 as a slave.
- Communication speed is 40kbps max.



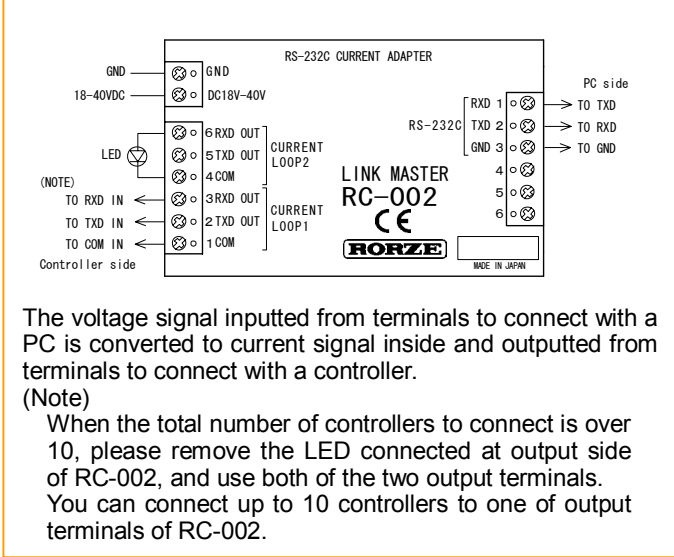
Examples



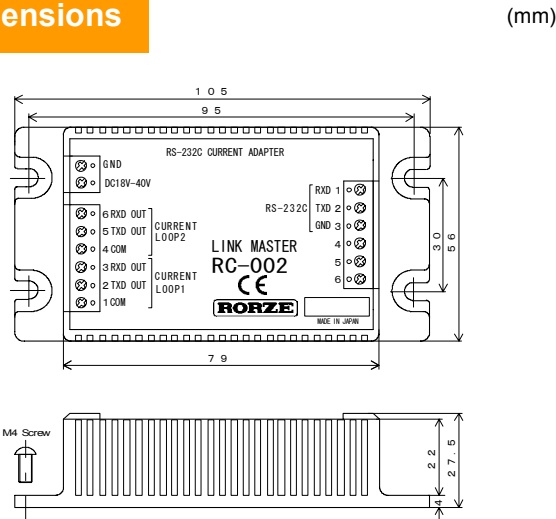
Specifications

Supply voltage	18 to 40VDC (including ripple)
Supply current	Less than 20mA (at 24VDC)
Communication method	Current loop transmission
Function	Convert the computer's RS-232C voltage signal to current loop signal
Baud rate	40kbps max.
Outside dimensions	27.5(H) × 105(W) × 56(D)mm
Weight	approx. 250g

Connection Terminal Layout



Dimensions



Adapter

Current loop → RS-232C

RC-003

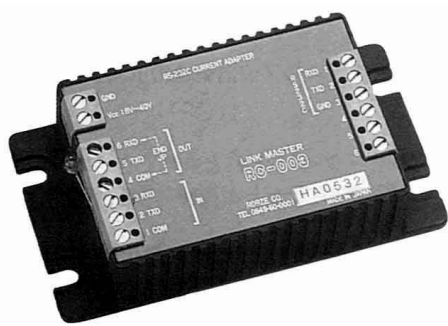
LINK MASTER

Description

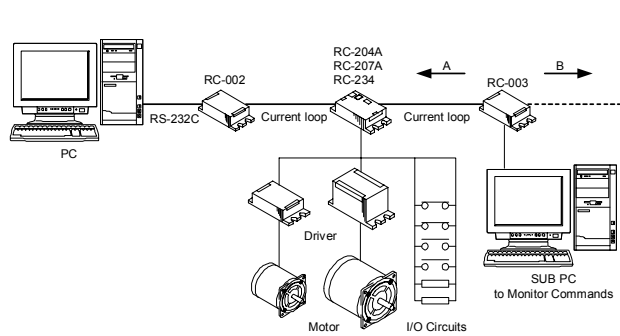
Link Master RC-003 converts current loop signal to RS-232C.

Features

- Long distance communication by using with RC-002
- Can display commands sent from a PC to each I/O master/ generate master on the other PC's monitor screen and thus it becomes easy to debug the control program.



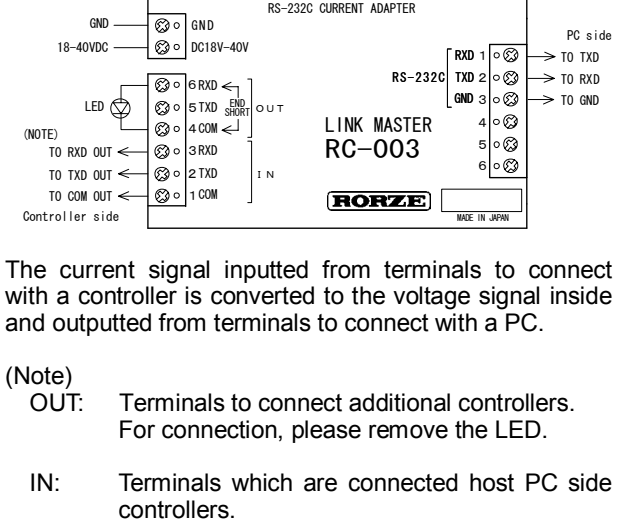
System configuration



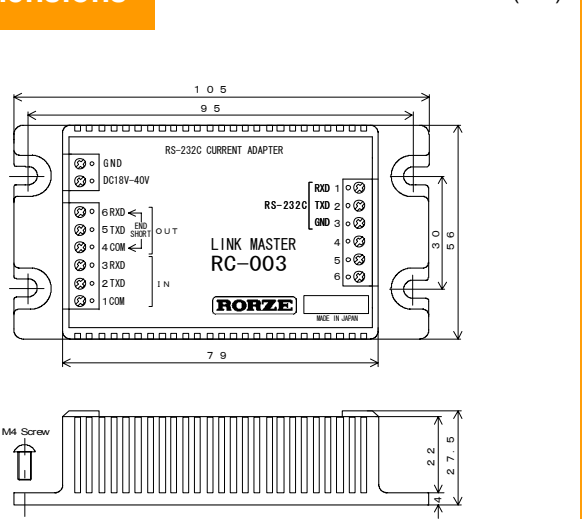
Specifications

Supply voltage	18 to 40VDC (including ripple)
Supply current	Less than 20mA (at 24VDC)
Communication method	Current loop transmission
Function	Convert current loop signal to RS-232C
Baud rate	40kbps max.
Outside dimensions	27.5(H) × 105(W) × 56(D)mm
Weight	approx. 250g

Connection Terminal Layout



Dimensions



Compact
Light-weight

Adapter USB → Current loop

RC-004

LINK MASTER



Description

The RC-004 is the communication adaptor (USB ⇔ current loop converter) for the RC-200 series controller. The RC-004 is operated only by the power supplied from the USB port, and using the device driver, it can be used as a virtual port from the host side.

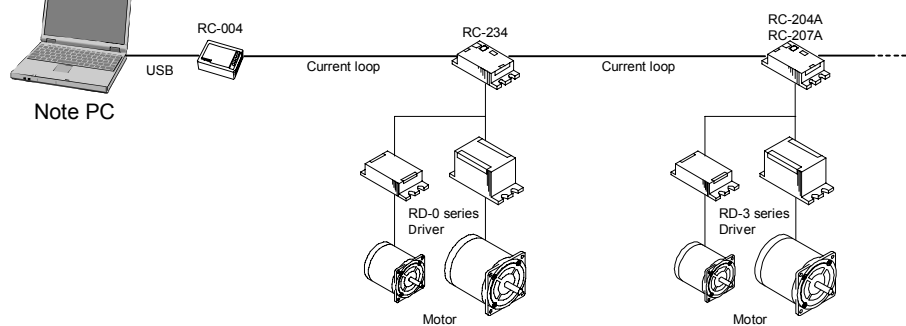
The RC-004 is designed as a development tool. Use the RC-002 instead of the RC-004 when mounting it on devices.

USB cable should be prepared by the user.

Features

- Compact and light-weight
- Power supply is unnecessary.
- Perfect for the development with the notebook computer without RS-232C.
- Can be used as a virtual COM port and thus it can use the past software data.

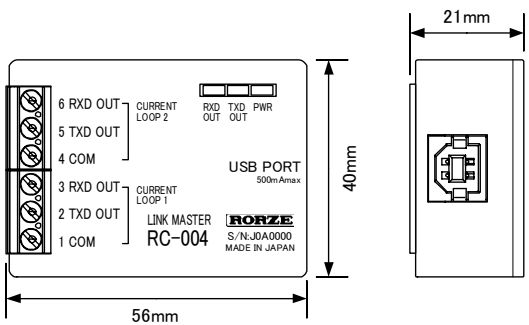
Examples



Specifications

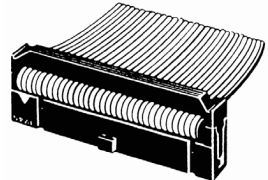

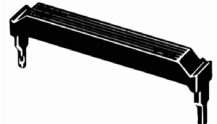
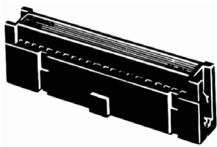


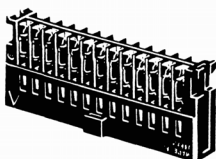

Supply current	Less than 500mA
Communication method	Current loop transmission
Function	Convert the computer's USB signal to current loop signal
Port insulation	Not insulated between USB and current loop
Max. communication speed	38400 bps (depending on controller specifications)
USB standards	In compliance with USB1.1
Operating System (OS)	Windows98, 2000, XP
Outside dimensions	21(H) × 56(W) × 40(D)mm
Weight	33g


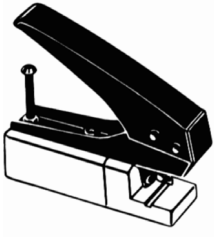
Dimensions



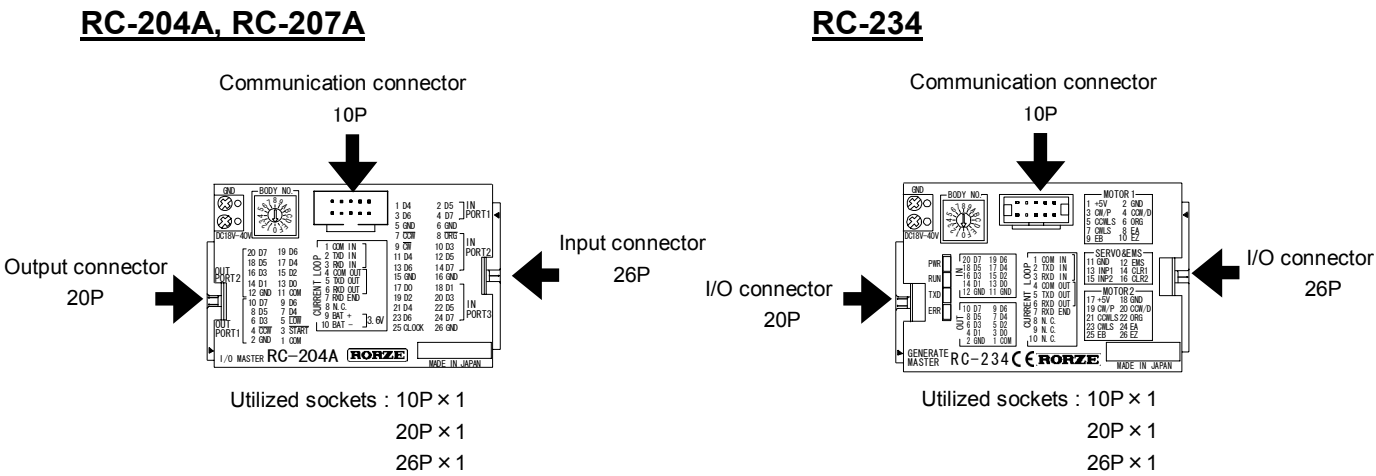
RC-004

Option connectors for wiring

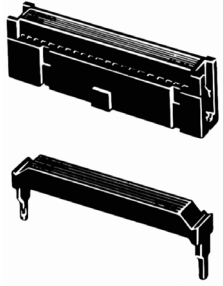
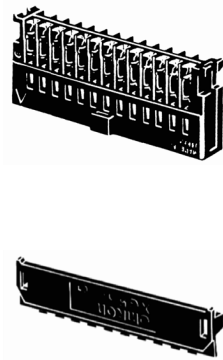

I/O Cable	Connectors	
Socket with flat cable Model : RCC-○○P□□□L Number of pins : 10, 20, 26 Length (cm) : 50, 100, 200, 300  Flat cable with a single-sided socket × 1  Lock lever × 1	Socket for flat cable Model : RCF-○○P Number of pins : 10, 20, 26  Strain relief × 1  Socket × 1  Lock lever × 1	Socket for discrete wires (for AWG#24) Model : RCR-○○P Number of pins : 10, 20, 26  Semi cover × 2  Socket × 1  Lock lever × 1

Tools	
Hand Crimper for flat-cable connectors Model : TOOL-901500 Necessary when connecting sockets with flat-cable. 	Hand Crimper for discrete-wire connectors Model : TOOL-XY2B-7006 Necessary when connecting sockets with discrete-wires. 

Sockets used for each controller



Suitable connectors (Manufactured by OMRON)

For Flat cable		
Sockets	XG4M -2630 (for 26P) -2030 (for 20P) -1030 (for 10P)	
Strain reliefs	XG4T -2604 (for 26P) -2004 (for 20P) -1004 (for 10P)	
For Discrete wire		
Sockets	for AWG#28 to 26 XG5M -2635 (for 26P) -2035 (for 20P) -1035 (for 10P) for AWG#24 XG5M -2632 (for 26P) -2032 (for 20P) -1032 (for 10P)	
Semicovers	XG5S -1301 (for 26P) -1001 (for 20P) -0501 (for 10P)	
Lock lever (Stopper to prevent from coming off a socket.) XG4Z-0002		

Smooth & Powerful

RD seriesStepping Motor Drivers

Selection table

Please select the best driver according to the motor, holding torque, current, and drive method, etc.

Driver classified table by motor (2 phase)

RORZE Motors			RORZE Drivers					
	Holding Torque (N·m)	Rated Current (A/ph)	RD-022A RD-122A	RD-021M8	RD-023MS RD-323MS RD-023A RD-123A RD-323A	RD-023MSH RD-023MB RD-323M10HA RD-323M50HA	RD-126A RD-326A	RD-026MSA RD-026MB RD-326M10A RD-326M50A
RM2C5648-30S/D	0.47	3.0				○		
RM2C5675-60S/D	1.03	6.0						○
RM2414S/D	0.14	1.5	△	○	○	○		
RM2424S/D	0.24	1.5	△	○	○	○		
RM2621S/D	0.21	3.0			○	○		
RM2640S/D	0.39	3.0			○	○		
RM2690S/D	0.78	3.0			○	○		
RM26A3S/D	1.3	3.0			○	○		
RM29A3S/D	1.3	6.0					○	○
RM29B2S/D	2.2	6.0					○	○

Driver classified table by motor (5 phase)

RORZE Motors			RORZE Drivers	
	Holding Torque (N·m)	Rated Current (A/ph)	RD-053MS RD-053A RD-153A RD-353A	RD-A051
RM5407SM/DM	0.074	1.5	○	○
RM5411SM/DM	0.11	1.5	○	○
RM5414SM/DM	0.14	1.5	○	○
RM5623S/D	0.23	3.0	○	
RM5640S/D	0.39	3.0	○	
RM5685S/D	0.83	3.0	○	
RM59A2S/D	1.23	3.0	○	
RM59B2S/D	2.2	3.0	○	
RM59D0S/D	3.9	3.0	○	

Driver classified table by function (2 phase)

Sort of motor and no. of lead wire	Method of driver control	Excitation method	Driver classified list by output current (A/ph)			
			0.3 - 1.3A	0.1 - 1.5A	0.5 - 3A (0.3 - 3A)※1 (0.1 - 3A)※2	1 - 6A (0.5 - 6A)※1 (0.2 - 6A)※2
2-ph stepping motor (6 lead wires)	Pulse Input Drivers	Full/Half step	RD-022A	RD-021M8	RD-023A RD-023MS RD-023MSH RD-023MB	RD-026MSA RD-026MB
		Microstep		RD-021M8	RD-023MS RD-023MSH RD-023MB	RD-026MSA RD-026MB
	Drivers with built-in pulse oscillator	Full/Half step	RD-122A		RD-123A RD-323A	RD-126A RD-326A
		Microstep			RD-323MS RD-323M10HA RD-323M50HA	RD-326M10A RD-326M50A
2-ph stepping motor (4 lead wires)	Pulse Input Drivers	Full/Half step		RD-021M8	RD-023A RD-023MSH RD-023MB	RD-026MSA RD-026MB
		Microstep		RD-021M8	RD-023MSH RD-023MB	RD-026MSA RD-026MB
	Drivers with built-in pulse oscillator	Full/Half step			RD-123A RD-323A	RD-126A RD-326A
		Microstep			RD-323M10HA RD-323M50HA	RD-326M10A RD-326M50A

※1 The figure in brackets is for RD-***MS
※2 The figure in brackets is for RD-***MB

Driver classified table by function (5 phase)

Sort of motor and no. of lead wire	Method of driver control	Excitation method	Driver classified list by output current (A/ph)	
			0.2 - 1.5A	0.5 - 3A
5-ph stepping motor (10 lead wires)	Pulse Input Drivers	Full/Half step	RD-A051 (100VAC)	RD-053A
		Microstep		RD-053MS
	Drivers with built-in pulse oscillator	Full/Half step		RD-153A RD-353A

Pulse input type.....Controls a motor by receiving clock pulses from a controller with built-in pulse generator connecting outside.

Built-in pulse oscillator type.....Because drivers generate clock pulses inside, you can use them together withRC-204A, RC-207A, RC-410 or PLC with built-in counter.
Also, trapezoidal control is available by adding a simple circuit.

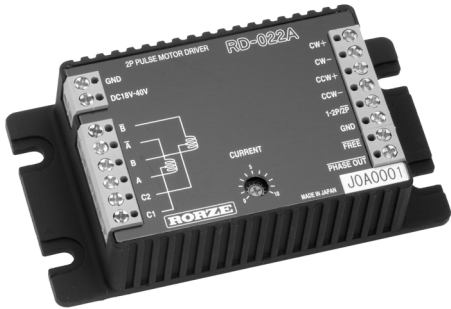
Full/half step.....When one pulse is put in, a motor rotates by the basic step angle in full step, and by half of the basic step angle in half step.

Micro stepControls a motor by dividing basic step angle of motor.
Low vibration, low speed revolution, quiet driving and high resolution are available.

Compact
Pulse input
Low cost

2-PH Stepping Motor Driver

RD-022A(2CK Input Type) **RD-022NA**(1CK Input Type)



Features

- FREE input to turn off excitation current of a motor
- PHASE OUT output for location of home for excitation timing
- Auto. current down

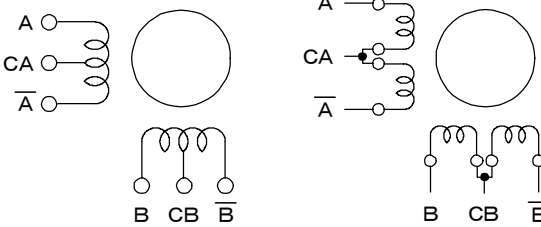
Specifications

Supply voltage	18 to 40VDC (including ripple)
Supply current	Approx. 2.4times rated coil current of motor (max.)
Motor current	0.3 to 1.3A/phase
Drive method	Unipolar, constant current chopper method
Excitation method	Full step (2P) or Half step (1-2P)
Auto. current down	50% of the rated current after about 0.3 seconds of inactivity
Response frequency	25kpps max.
Protective circuitry	Low voltage protection
Outside dimensions	27.5(H) × 105(W) × 56(D)mm
Weight	approx. 250g

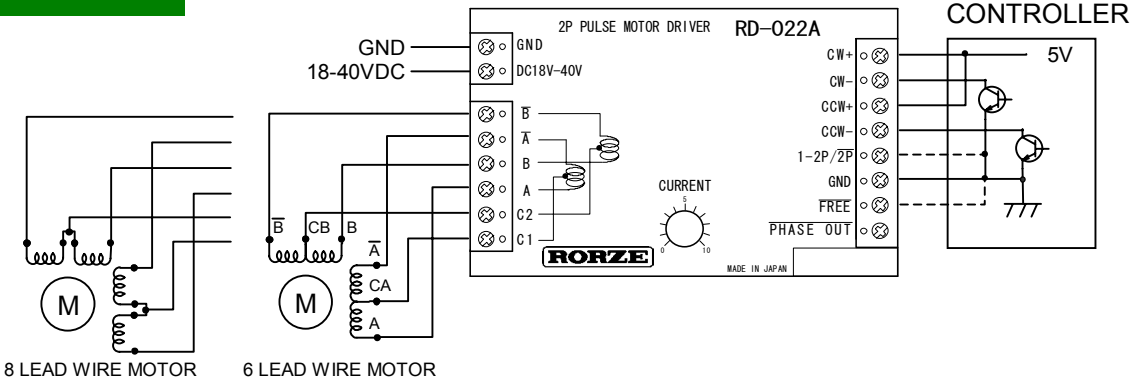
Suitable motors

Manufacturer	Model No.
RORZE Co.	RM2414, RM2424
OTHER	HB type (PM type) 2-ph stepping motor (6 lead wires)

Motor Wiring



Wiring Diagram



Functions

Clock inputs (CW(CLOCK), CCW)

RD-022A

CW+/- Motor rotates one step in CW direction with a pulse current from CW+ to CW- terminal.

CCW+/- Motor rotates one step in CCW direction with a pulse current from CCW+ to CCW- terminal.

RD-022NA

CLOCK+/- & CCW+/-

Motor rotates one step in CW direction with a pulse current from CLOCK+ to CLOCK- terminal and CCW input OFF.

Motor rotates one step in CCW direction with a pulse current from CLOCK+ to CLOCK- terminal and CCW input turned ON.

1-2P/2P (Input)

Motor rotates with 1-2phase excitation (half step) when this terminal is High level (open) and with 2-phase excitation (Full step) when Low level (connects to GND potential).

FREE (Input)

Stepping motor drive current turns OFF at Low level (connects to GND potential) and the motor shaft can be rotated by hand. When turning FREE input to High level (open) again, the motor is excited at the phase home.

PHASE OUT (Output)

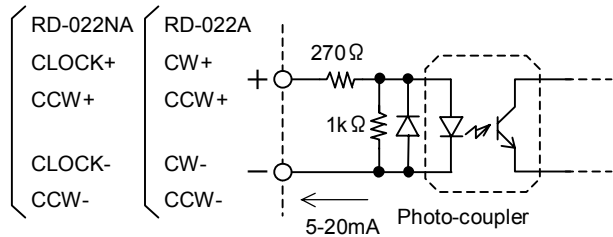
PHASE OUT output is turned ON at the phase home. Once every 4 steps in full step operation (or once every 8 steps in half step), one pulse is put out.

Current Adjustment Trimmer

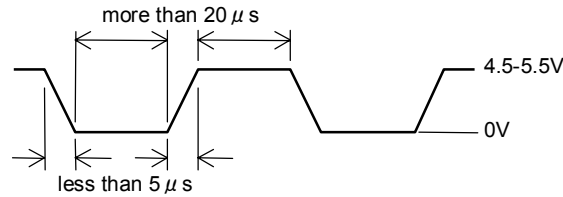
Trimmer to adjust the drive current.

Circuits

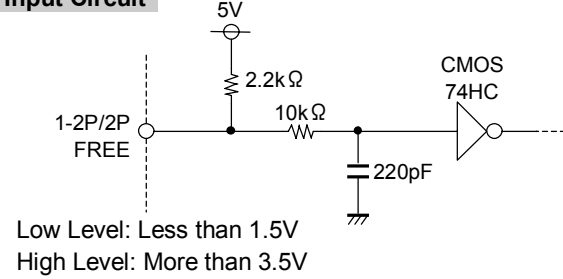
Clock Inputs (CW(CLOCK), CCW)



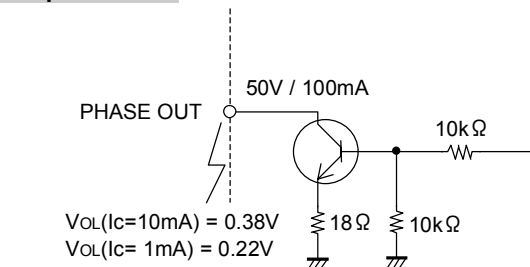
Clock Pulse Specification



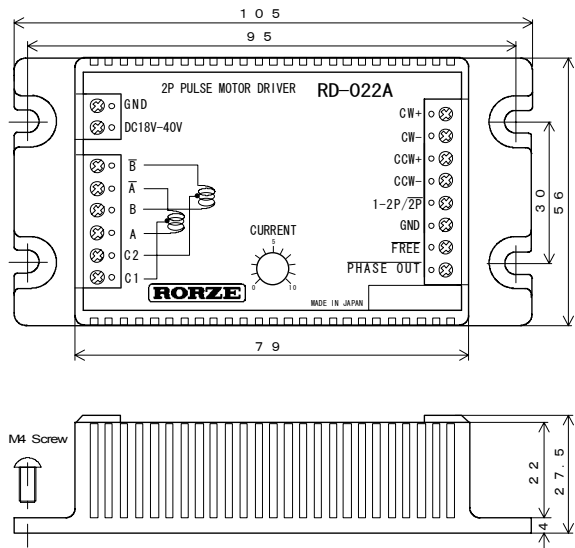
Input Circuit



Output Circuit



Dimensions



Pulse input

2-PH Stepping Motor Driver

RD-023A(2CK Input Type) **RD-023NA**(1CK Input Type)



Features

- FREE input to turn off excitation current of a motor
- PHASE OUT output for location of home for excitation timing
- Auto. current down

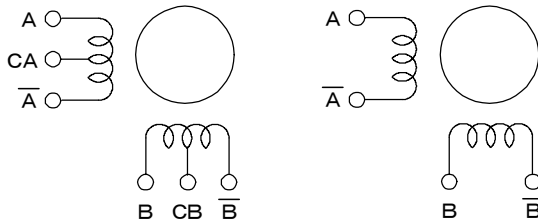
Specifications

Supply voltage	18 to 40VDC (including ripple)
Supply current	Approx. 2times rated coil current of motor (max.)
Motor current	0.5 to 3A/phase
Drive method	Bipolar, constant current chopper method
Excitation method	Full step (2P) or Half step (1-2P)
Auto. current down	50% of the rated current after about 0.3 seconds of inactivity
Response frequency	20kpps max.
Protective circuitry	Overheating, over current, & low voltage protection
Outside dimensions	63H x 56W x 105Dmm (2.5"H x 2.2"W x 4.1"D)
Weight	approx. 500g

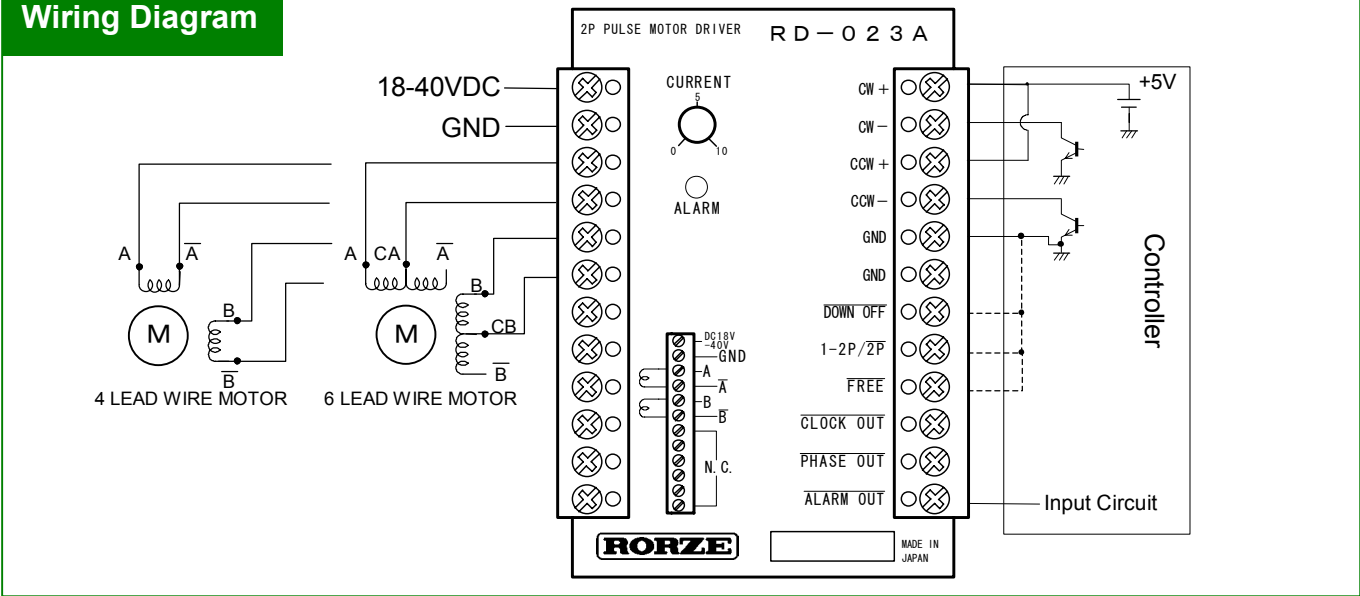
Suitable motors

Manufacturer	Model No.
RORZE Co.	RM24**, RM26**
OTHER	HB type (PM type) 2-ph stepping motor (4 or 6 lead wires)

Motor Wiring



Wiring Diagram



Functions

Clock inputs (CW(CLOCK), CCW)

RD-023A

CW+/- Motor rotates one step in CW direction with a pulse current from CW+ to CW- terminal.

CCW+/- Motor rotates one step in CCW direction with a pulse current from CCW+ to CCW- terminal.

RD-023NA

CLOCK+/- & CCW+/-

Motor rotates one step in CW direction with a pulse current of from CLOCK+ to CLOCK- terminal and CCW input OFF.

Motor rotates one step in CCW direction with a pulse current from CLOCK+ to CLOCK- terminal and CCW input turned ON.

DOWN OFF (Input)

Turning this terminal to Low level (connecting to GND potential) overrides the current down circuit and holds the motor stationary with full current.

1-2P/2P (Input)

Motor rotates with 1-2phase excitation (half step) when this terminal is High level (open) and with 2-phase excitation (Full step) when Low level (connects to GND potential).

FREE (Input)

Stepping motor drive current turns OFF at Low level (connects to GND potential) and the motor shaft can be rotated by hand. When turning FREE input to High level (open) again, the motor is excited at the phase home.

CLOCK OUT (Output)

Outputs clock pulses input to Clock input terminal CW(CLOCK), CCW.

PHASE OUT (Output)

PHASE OUT output is turned ON at the phase home. Once every 4 steps in full step operation (or once every 8 steps in half step), one pulse is put out.

ALARM OUT (Output)

When the internal temperature of the driver reaches 75°C, ALARM OUT output is turned ON and ALARM LED will light. Also, a motor will stop and auto. current down will work. If the body temperature drops about 15°C below the triggered temperature, returns automatically.

ALARM LED

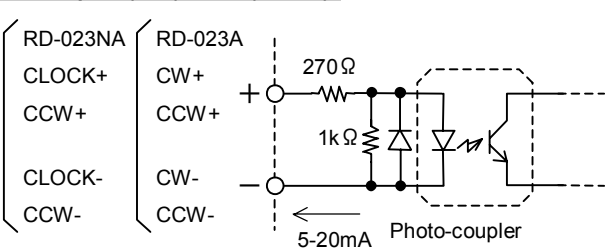
This will light when Overheating protection circuit is in operation.

Current Adjustment Trimmer

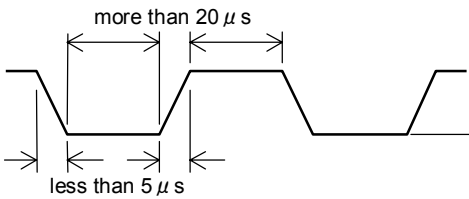
Trimmer to adjust the drive current.

Circuits

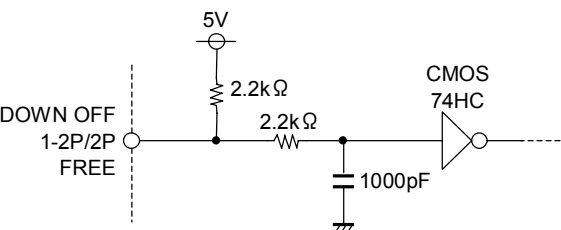
Clock Inputs (CW(CLOCK), CCW)



Clock Pulse Specification

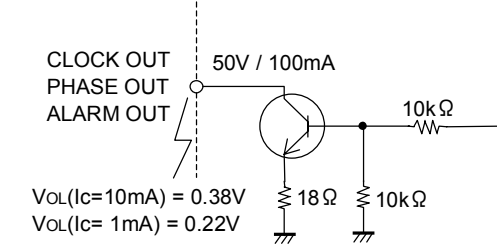


Input Circuits

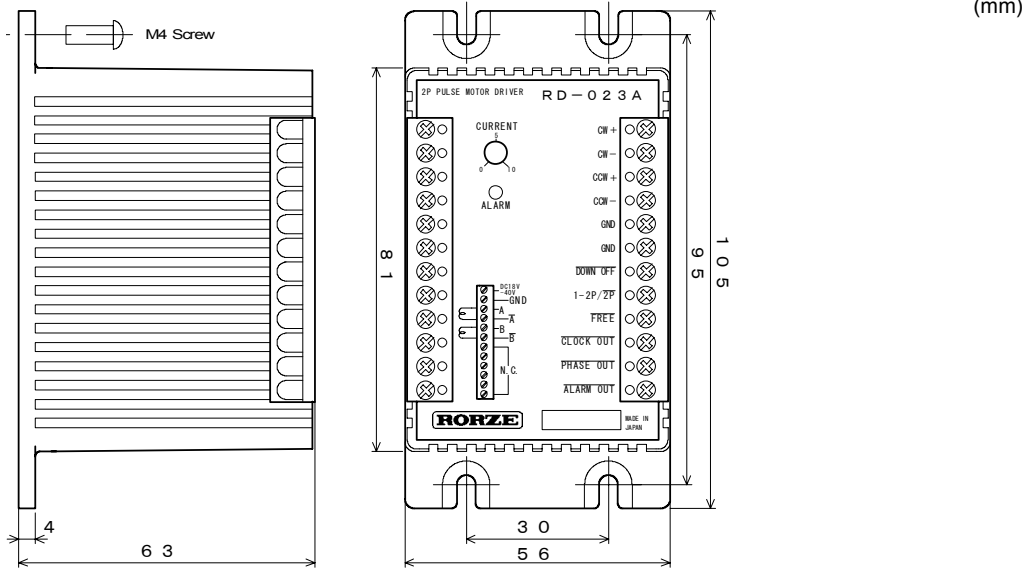


Low Level: Less than 1.5V (Provided FREE is less than 0.8V)
High Level: More than 3.5V

Output Circuits



Dimensions



Compact
Low cost
Lower vibration
Pulse input

2-PH Selectable Microstepping Motor Driver

RD-021M8

1,600 steps/rev. 10 to 40VDC



Features

- Extremely compact
- Large supply voltage range (10 to 40VDC)
- Lower vibration
- Selectable microstep (full step, half step, 1/4 step, 1/8 step)
- Photo-isolated inputs
- Selectable clock – 1clk. or 2clk. Input
- Selectable current setting with external resistance
- Auto. current down

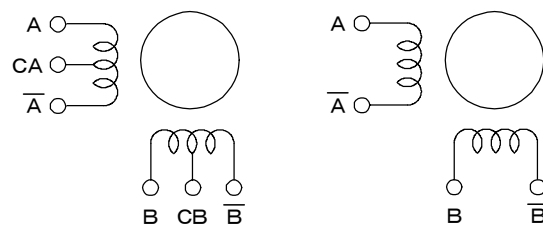
Specifications

Supply voltage	10 to 40VDC (including ripple)
Supply current	Approx. 1.2times rated coil current of motor (max.)
Motor current	0.1 to 1.5A/phase
Drive method	Bipolar, constant current chopper method
Microstep resolution	Up to 8 microsteps/step Selections: 1,2,4,8
Auto. current down	50% of the rated current after about 0.3 seconds of inactivity
Response frequency	100kpps max.
Protective circuitry	Low voltage protection Over voltage absorption
Outside dimensions	32(H) × 50(W) × 80(D)mm
Weight	approx. 150g

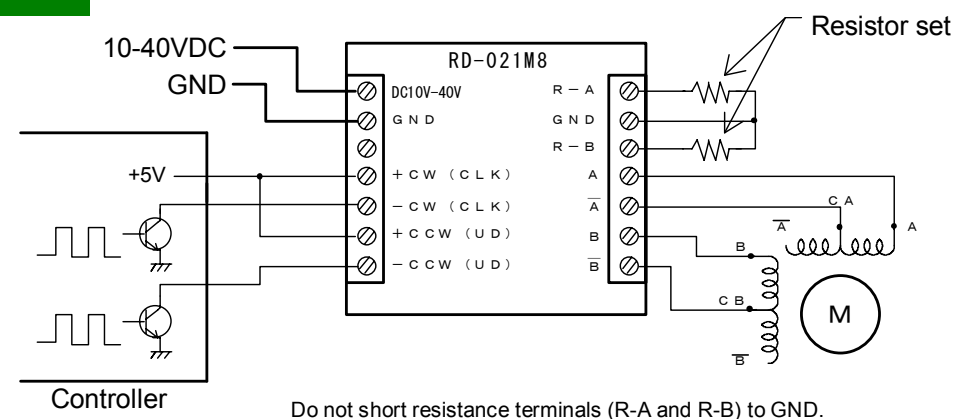
Suitable motors

Manufacturer	Model No.
RORZE Co.	RM24**, RM26**
OTHER	HB type (PM type) 2-ph stepping motor (4 or 6 lead wires)

Motor Wiring



Wiring Diagram



Functions

Clock inputs (CW/CLK, CCW/UD)

In case of using Two Clock Input (2CK)

CW+/- Motor rotates one step in CW direction with a pulse current from CW+ to CW- terminal.

CCW+/- Motor rotates one step in CCW direction with a pulse current from CCW+ to CCW- terminal.

In case of using One Clock Input (1CK)

CLK+/- & UD+/-

Motor rotates one step in CW direction with a pulse current from CLK+ to CLK- terminal and UD input off.

Motor rotates one step in CCW direction with a pulse current from CLK+ to CLK- terminal and UD input turned ON.

POWER LED

This will light whenever the voltage is supplying.

Dip Switches

1) Microstep Resolution

You can select microstep resolution from among 4 selections using dip switch Bit 1 and Bit 2.

Bit 1	Bit 2	Microstep Resolution(M)
OFF	OFF	8
OFF	ON	4
ON	OFF	2 (Half)
ON	ON	1 (Full)

2) Select Clock Input (1CK/2CK)

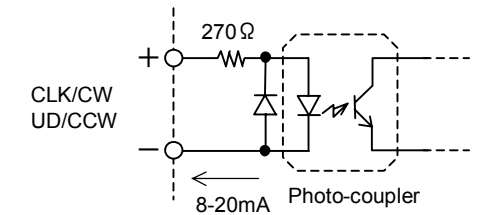
You can select pulse input method, two clock input method (2CK) or Pulse & Direction input method (1CK).

Bit 3	Bit 4	Clock Input
OFF	OFF	x
OFF	ON	1CK
ON	OFF	2CK
ON	ON	x

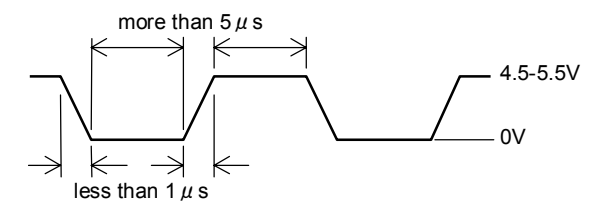
x : Invalid setting

Circuits

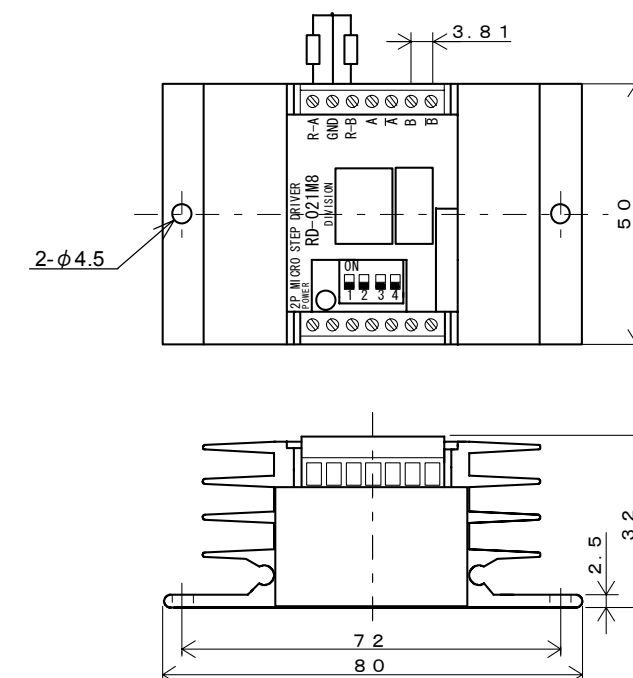
Clock Inputs (CW/CLK, CCW/UD)



Clock Pulse Specification



Dimensions



(mm)

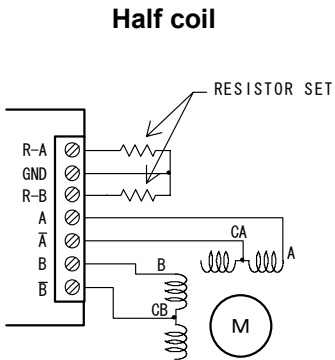
RD-021M8

Resistance Table for Current Setting

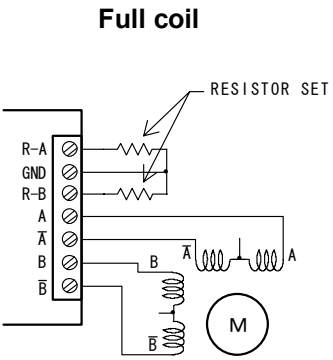
RORZE MOTOR	Rated Current (A/ph)	Resistance(Ω)		Wiring
		Full step	Microstep	
RM2414	1.5	0.56	0.33	Half coil
RM2424	1.5	0.56	0.33	Half coil
RM2621	3.0	0.56	0.39	Full coil
RM2640	3.0	0.56	0.39	Full coil
RM2690	3.0	0.51	0.33	Full coil
RM26A3	3.0	0.51	0.33	Full coil

ORIENTAL MOTOR	Rated Current (A/ph)	Resistance(Ω)		Wiring
		Full step	Microstep	
PK243-01	0.95	0.91	0.62	Half coil
PK243-02	0.4	3.3	1.8	Half coil
PK244-01	1.2	0.68	0.43	Half coil
PK244-02	0.8	1.1	0.68	Half coil
PK244-03	0.4	3.3	1.8	Half coil
PK245-01	1.2	0.68	0.43	Half coil
PK264-01	1.0	0.82	0.51	Half coil
PK266-01	1.0	0.82	0.51	Half coil
PK268-01	1.0	0.82	0.51	Half coil

©Please isolate lead wires that aren't used in either of wirings.



Connect the lead wire of motor, A, CA, B, CB to the terminals of driver, A, A-bar, B, B-bar respectively.



Connect the lead wire of motor, A-bar, A, B-bar, B to the terminals of driver, A, A-bar, B, B-bar respectively. This wiring provides the rated torque with half of current of motor rated current. However, the maximum of RPM decreases approx. half as compared with half coil drive using COM terminal.

If you need literatures regarding to how to measure current value, how to decide the resistor value in case of using a motor that isn't listed in the above table, please request us.

Resistance Model No. List

Model No.	Resistance	
	Ω	Watts
R30	0.30	3
R33	0.33	3
R39	0.39	3
R43	0.43	3
R47	0.47	3
R51	0.51	3
R56	0.56	3
R62	0.62	3
R68	0.68	2
R75	0.75	2
R82	0.82	2
R91	0.91	2
1R0	1.00	2
1R1	1.10	2
1R2	1.20	2
1R3	1.30	1
1R5	1.50	1
1R6	1.60	1
1R8	1.80	1
2R0	2.00	1

Model No.	Resistance	
	Ω	Watts
	2.20	1
2R4	2.40	1
2R7	2.70	0.5
	3.00	0.5
3R3	3.30	0.5
3R9	3.90	0.5
4R3	4.30	0.5
4R7	4.70	0.5
	5.10	0.5
5R6	5.60	0.25
6R2	6.20	0.25
6R8	6.80	0.25
	7.50	0.25
8R2	8.20	0.25
	9.10	0.25
	10.00	0.25
	11.00	0.125
	12.00	0.125
13R	13.00	0.125
	15.00	0.125

(Note)

- All resistors attached to RD-021M8 are all more than 2W.
- We don't provide resistors which model numbers are blank. If need, please purchase by yourself. (Watts = 0.8 × 0.8 / R × Safety factor)

Resistor set (RD-RK01)

This is useful when motor current is undecided and you'd like to try various resistors. There are four kinds of resistors in the sample set. (1.1, 2.0, 4.7 and 8.2Ω 2 pcs. each) Combining 4 kinds of resistors in parallel can make the resistance value from 8.2Ω to 0.57Ω.

Appointment of Model

Model: RD-021M8-□□□

Please put the resistance model No. in □□□, the last part of model No.

As for the resistance model No., please refer to the above list and then appoint resistance model No. (We attach a pair of resistances (the same model no.) for a RD-021M8 with no charge.)

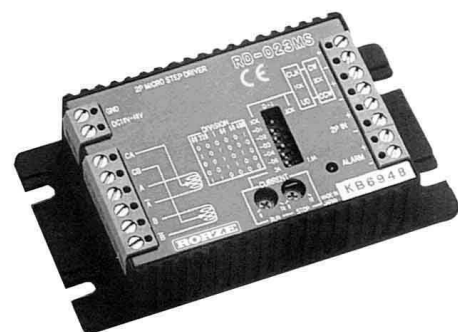
Ex.) External resistances: 2.0Ω → RD-021M8-2R0
 If you don't need resistances → RD-021M8-000.

Compact
Lower vibration
Pulse input
CE

2-PH Selectable Microstepping Motor Driver

RD-023MS

80,000 steps/rev.



Features

- Compliant with CE Marking
- Lower vibration
- Selectable microstep (22 selections)
- Photo-isolated inputs and outputs
- Selectable clock – 1clk. or 2clk. Input
- Auto. current down (Adjustable stop current)

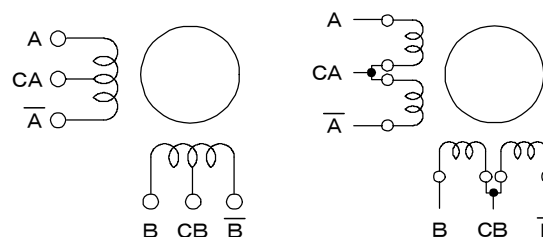
Specifications

Supply voltage	18 to 40VDC (including ripple)
Supply current	Approx. 1.2times rated coil current of motor (max.)
Motor current	0.3 to 3A/phase
Drive method	Unipolar, constant current chopper method
Microstep resolution	Up to 400 microsteps/step Selections: 1,2,4,8,16,32,64,2.5,5,10,20,40,80,160,320,6.25,12.5,25,50,100,200,400
Auto. current down	0 to 80% of the run current after about 0.3 seconds of inactivity according to Stop Current setting
Response frequency	500kpps max.
Protective circuitry	Overheating, over current, & low voltage protection
Outside dimensions	27.5(H) × 105(W) × 56(D)mm
Weight	approx. 250g

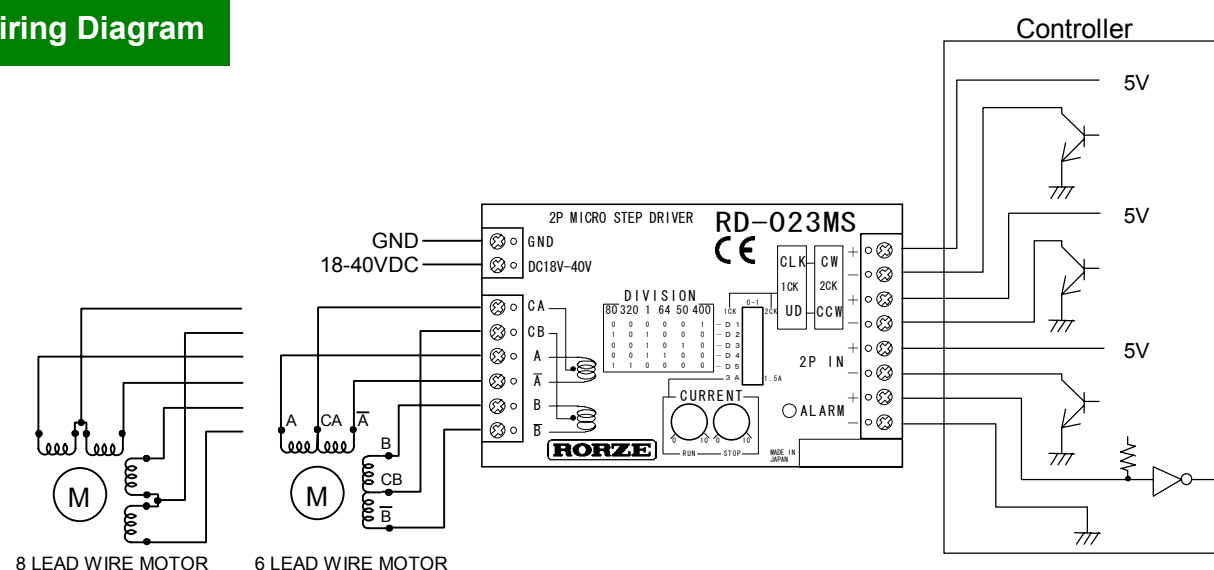
Suitable motors

Manufacturer	Model No.
RORZE Co.	RM24**, RM26**
OTHER	HB type (PM type) 2-ph stepping motor (6 lead wires)

Motor Wiring



Wiring Diagram



Functions

Clock inputs (CW/CLK, CCW/UD)

In case of using Two Clock Input (2CK)

CW+/- Motor rotates one step in CW direction with a pulse current from CW+ to CW- terminal.

CCW+/- Motor rotates one step in CCW direction with a pulse current from CCW+ to CCW- terminal.

In case of using One Clock Input (1CK)

CLK+/- & UD+/-

Motor rotates one step in CW direction with a pulse current from CLK+ to CLK- terminal and UD input off.

Motor rotates one step in CCW direction with a pulse current from CLK+ to CLK- terminal and UD input turned ON.

Full Step Input (2P IN +/-)

Motor rotates in full step mode with a pulse current from "2P IN +" to "2P IN -".

Alarm Output (ALARM +/-)

When the internal temperature of the driver reaches about 70°C, ALARM output is turned ON and ALARM LED will light. Also, a motor will stop and auto. current down will work. If the body temperature drops about 10°C below the triggered temperature, returns automatically.

ALARM LED

This will light when Overheating protection circuit is in operation.

Run Current Adjustment Trimmer

Trimmer to adjust the drive current.

Stop Current Adjustment Trimmer

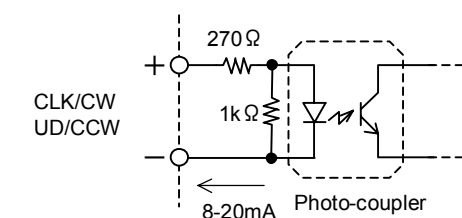
Trimmer to set the stop current to any value between 0 to 80% of the run current.

Dip Switches

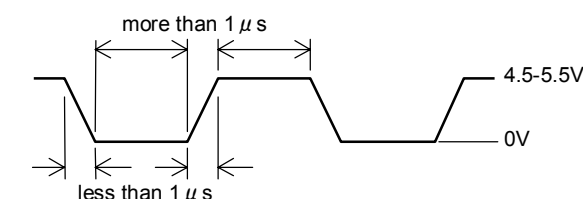
- 1) Select Clock Input (1CK/2CK)
- 2) Select Microstep Resolution
- 3) Select Current Range (3A/1.5A)

Circuits

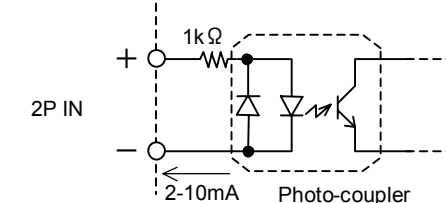
Clock Inputs (CW/CLK, CCW/UD)



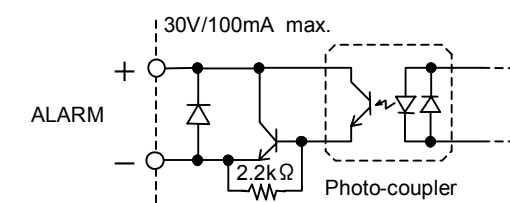
Clock Pulse Specification



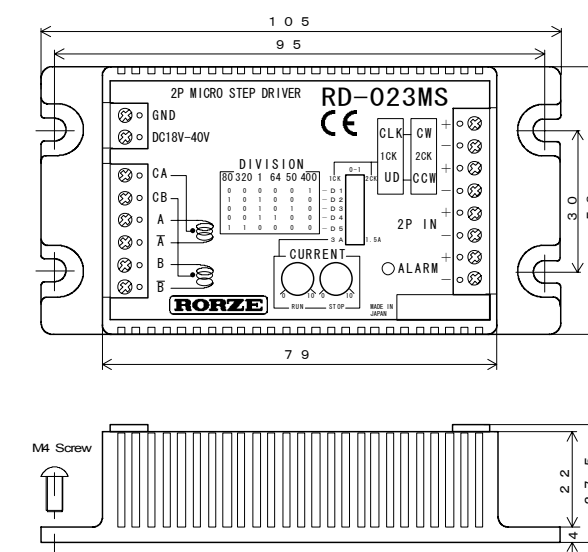
Input Circuits



Output Circuits



Dimensions

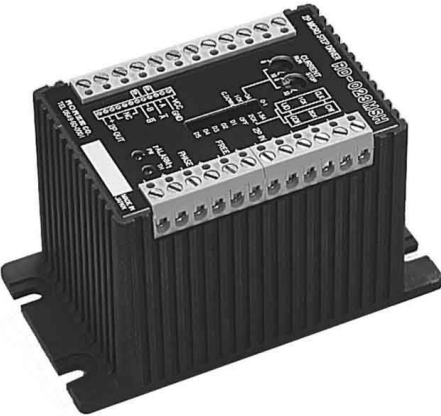


High endurance
of voltage
Lower heat generation
Lower vibration
Pulse input

2-PH Selectable Microstepping Motor Driver

RD-023MSH

80,000 steps/rev. 18 to 80VDC



Features

- High speed rotation is available with the maximum power of 80VDC
- Lower heat generation with the new circuit system
- Lower vibration with high resolution micro step
- Selectable microstep (22 selections)
- Photo-Isolated inputs and outputs
- Selectable clock – 1clk. or 2clk. Input
- Auto. current down (Adjustable stop current)

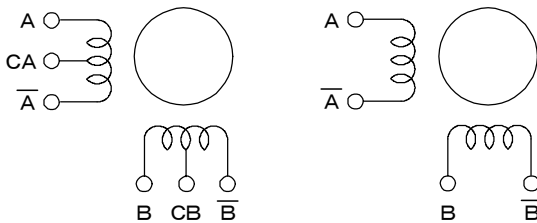
Specifications

Supply voltage	18 to 80VDC (including ripple)
Supply current	Approx. 1.2times rated coil current of motor (max.)
Motor current	0.3 to 3A/phase
Drive method	Bipolar, constant current chopper method
Microstep resolution	Up to 400 microsteps/step Selections: 1,2,4,8,16,32,64,2.5,5,10,20,40,80,160,320,6.25,12.5,25,50,100,200,400
Auto. current down	0 to 80% of the run current after about 0.3 seconds of inactivity according to Stop Current setting
Response frequency	500kpps max.
Protective circuitry	Overheating, Over current, low and high voltage protection
Outside dimensions	63(H) × 56(W) × 105(D)mm
Weight	approx. 580g

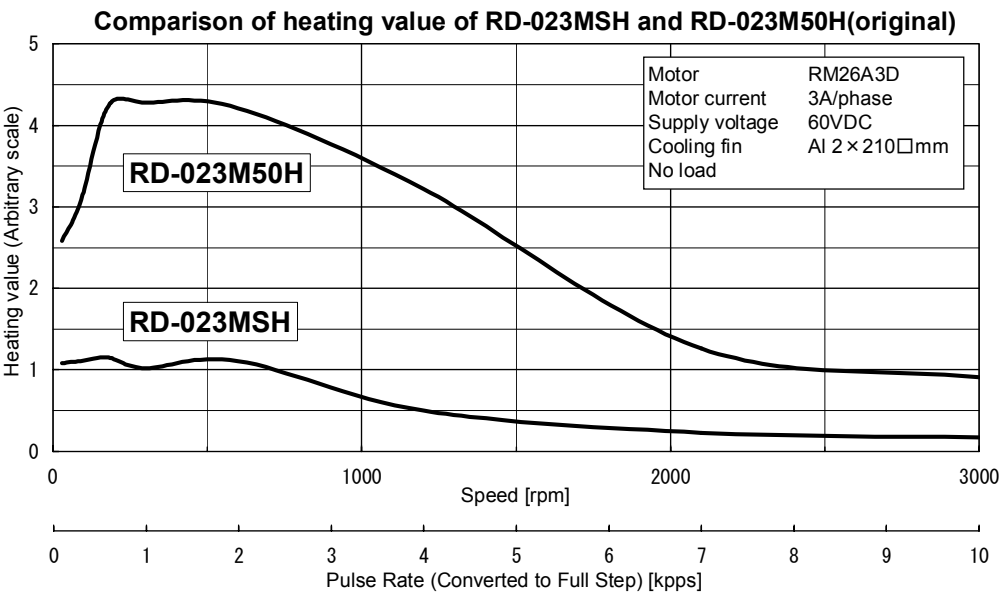
Suitable motors

Manufacturer	Model No.
RORZE Co.	RM24**, RM26**, RM2C5648
OTHER	HB type (PM type) 2-ph stepping motor (4 or 6 lead wires)

Motor Wiring



Temperature Chart



Functions

Clock inputs (CW/CLK, CCW/UD)

In case of using Two Clock Input (2CK)

CW+/- Motor rotates one step in CW direction with a pulse current from CW+ to CW- terminal.

CCW+/- Motor rotates one step in CCW direction with a pulse current from CCW+ to CCW- terminal.

In case of using One Clock Input (1CK)

CLK+/- & UD+/-

Motor rotates one step in CW direction with a pulse current from CLK+ to CLK- terminal and UD input off.

Motor rotates one step in CCW direction with a pulse current from CLK+ to CLK- terminal and UD input turned ON.

Full Step Input (2P IN +/-)

Motor rotates in full step mode with a pulse current from "2P IN +" to "2P IN -".

Free Input (FREE +/-)

All of motor wires are shorted to GND for approx. 1 sec. and they become open state and then motor shaft will become free with a pulse current from "FREE+" to "FREE-".

Phase Output (PHASE +/-)

PHASE output is turned ON at the phase home.

One pulse is put out every time the motor moves 7.2° in case of 1.8° motor.

Alarm Output (ALARM +/-)

ALARM output will be turned ON when any of overheating protection circuit, over voltage, over current, or low power supply voltage protection circuit is in operation.

2P Output (2P OUT +/-)

In case that the setting of microstep resolution(M) is except 1, 2.5, 5, 6.25, 12.5, 25, this outputs pulses equivalent to full step.

TH ALARM LED

This will light when the overheating protection circuit is in operation.

PW ALARM LED

This will light when any of over voltage, over current or low power supply voltage protection circuit is in operation.

Run Current Adjustment Trimmer

Trimmer to adjust the drive current.

Stop Current Adjustment Trimmer

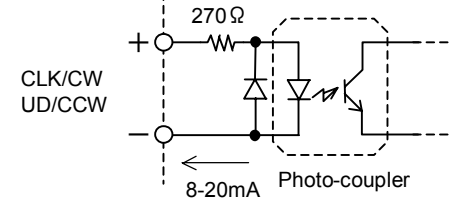
Trimmer to set the stop current to any value between 0 to 80% of the run current.

Dip Switches

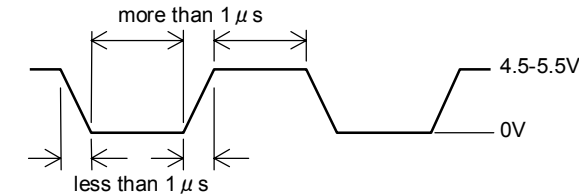
- 1) Select Current Range (3A/1.5A)
- 2) Select Clock Input (1CK/2CK)
- 3) Select Auto. Current Down
- 4) Select Microstep Resolution

Circuits

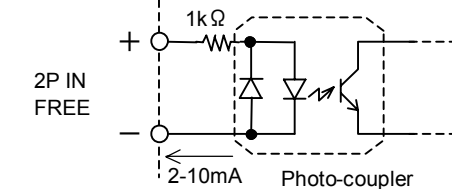
Clock Inputs (CW/CLK, CCW/UD)



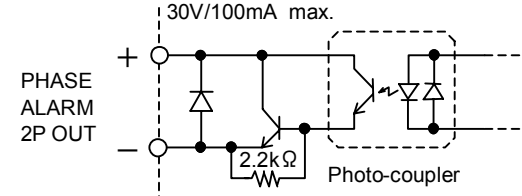
Clock Pulse Specification



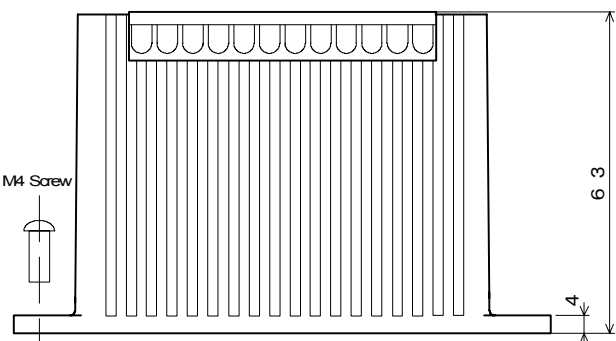
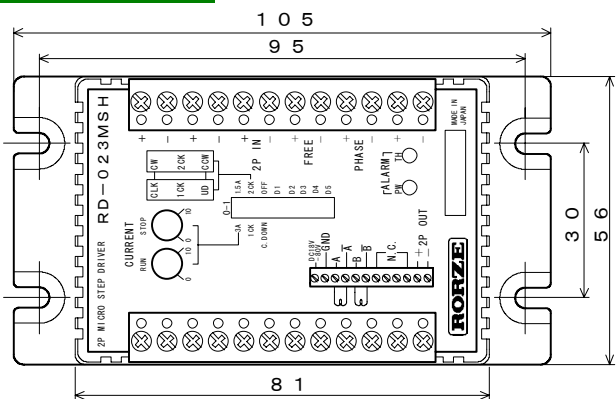
Input Circuits



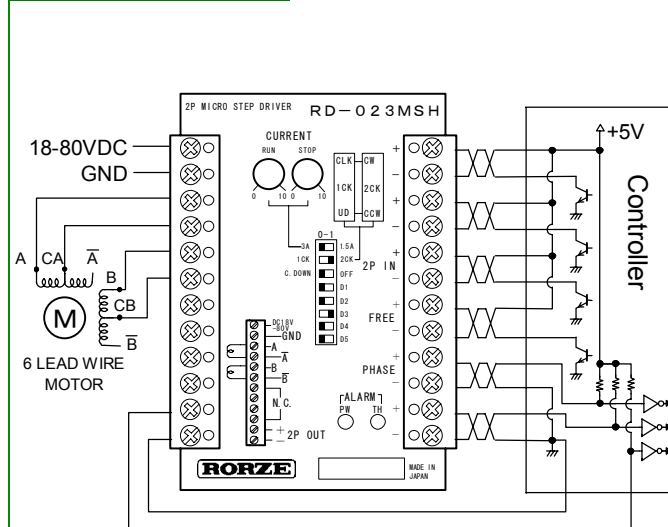
Output Circuits



Dimensions



Wiring Diagram

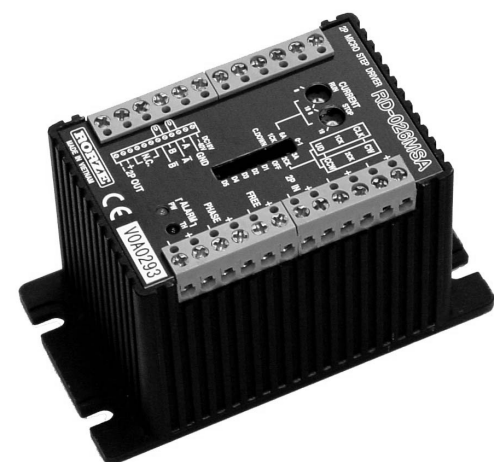


High power
Lower heat generation
Lower vibration
Pulse input
CE

2-PH Selectable Microstepping Motor Driver

RD-026MSA

80,000 steps/rev.



Features

- Compliant with CE Marking.
- High power (6A/Phase max.)
- Lower heat generation with the new circuit system
- Lower vibration with high resolution microstep
- Selectable microstep (22 selections)
- Photo-Isolated inputs and outputs
- Selectable clock – 1clk. or 2clk. Input
- Auto. current down (Adjustable stop current)

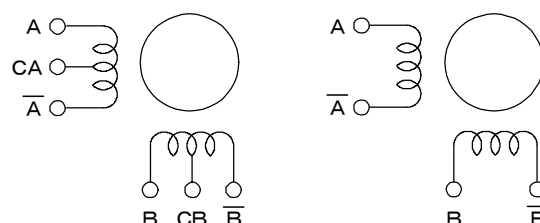
Specifications

Supply voltage	18 to 40VDC (including ripple)
Supply current	Approx. 1.2times rated coil current of motor (max.)
Motor current	0.5 to 6A/phase
Drive method	Bipolar, constant current chopper method
Microstep resolution	Up to 400 microsteps/step Selections: 1, 2, 4, 8, 16, 32, 64, 2.5, 5, 10, 20, 40, 80, 160, 320, 6.25, 12.5, 25, 50, 100, 200, 400
Auto. current down	0 to 80% of the run current after about 0.3 seconds of inactivity according to Stop Current setting
Response frequency	500kpps max.
Protective circuitry	Overheating, Over current, low and high voltage protection
Outside dimensions	63(H) × 56(W) × 105(D)mm
Weight	approx. 580g

Suitable motors

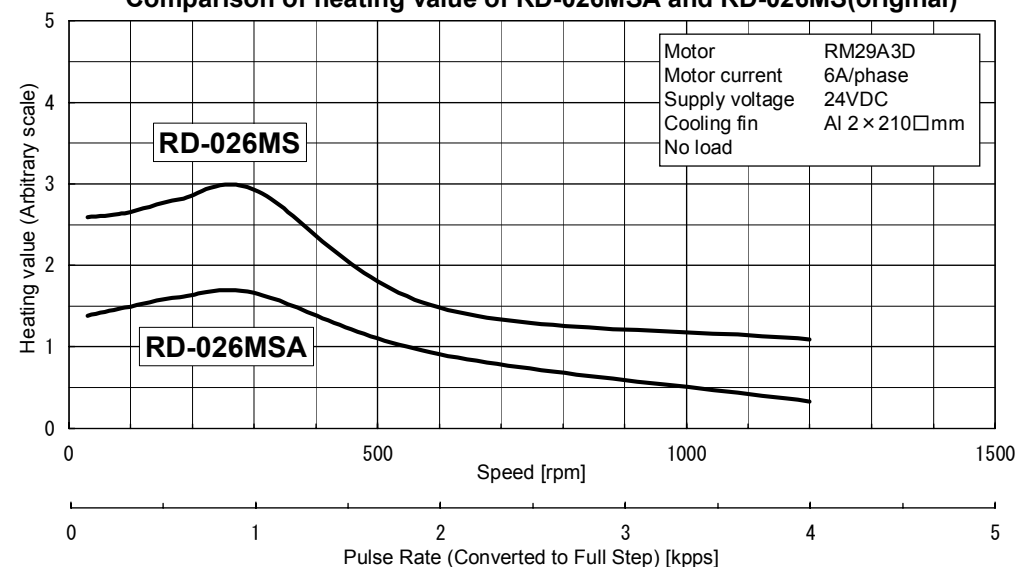
Manufacturer	Model No.
RORZE Co.	RM2000 series, RM2C5675
OTHER	HB type (PM type) 2-ph stepping motor (4 or 6 lead wires)

Motor Wiring



Temperature Chart

Comparison of heating value of RD-026MSA and RD-026MS(original)



Functions

Clock inputs (CW/CLK, CCW/UD)

In case of using Two Clock Input (2CK)

CW+/- Motor rotates one step in CW direction with a pulse current from CW+ to CW- terminal.

CCW+/- Motor rotates one step in CCW direction with a pulse current from CCW+ to CCW- terminal.

In case of using One Clock Input (1CK)

CLK+/- & UD+/- Motor rotates one step in CW direction with a pulse current from CLK+ to CLK- terminal and UD input off.

Motor rotates one step in CCW direction with a pulse current from CLK+ to CLK- terminal and UD input turned ON.

Full Step Input (2P IN +/-)

Motor rotates in full step mode with a pulse current from "2P IN +" to "2P IN -".

Free Input (FREE +/-)

All of motor wires are shorted to GND for approx. 1 sec. and they become open state and then motor shaft will become free with a pulse current from "FREE+" to "FREE-".

Phase Output (PHASE +/-)

PHASE output is turned ON at the phase home.

One pulse is put out every time the motor moves 7.2° in case of 1.8° motor.

Alarm Output (ALARM +/-)

ALARM output will be turned ON when any of overheating protection circuit, over voltage, over current, or low power supply voltage protection circuit is in operation.

2P Output (2P OUT +/-)

In case that the setting of microstep resolution(M) is except 1, 2.5, 5, 6.25, 12.5, 25, this outputs pulses equivalent to full step.

TH ALARM LED

This will light when the overheating protection circuit is in operation.

PW ALARM LED

This will light when any of over voltage, over current or low power supply voltage protection circuit is in operation.

Run Current Adjustment Trimmer

Trimmer to adjust the drive current.

Stop Current Adjustment Trimmer

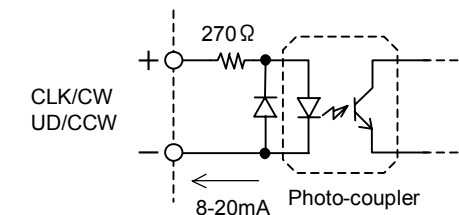
Trimmer to set the stop current to any value between 0 to 80% of the run current.

Dip Switches

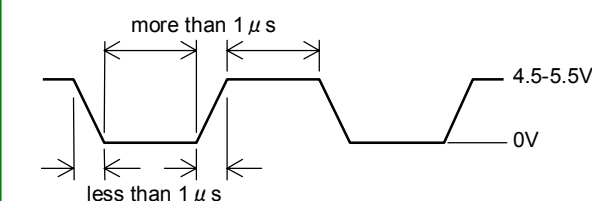
- 1) Select Current Range (6A/3A)
- 2) Select Clock Input (1CK/2CK)
- 3) Select Auto. Current Down
- 4) Select Microstep Resolution

Circuits

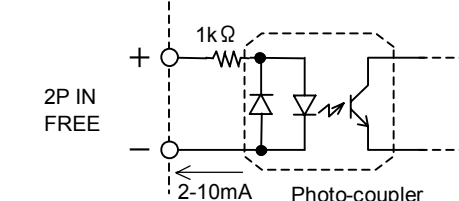
Clock Inputs (CW/CLK, CCW/UD)



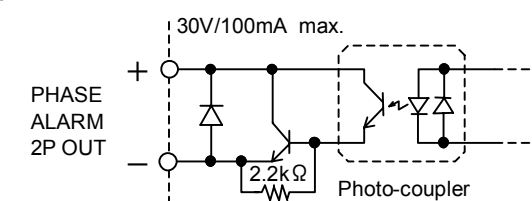
Clock Pulse Specification



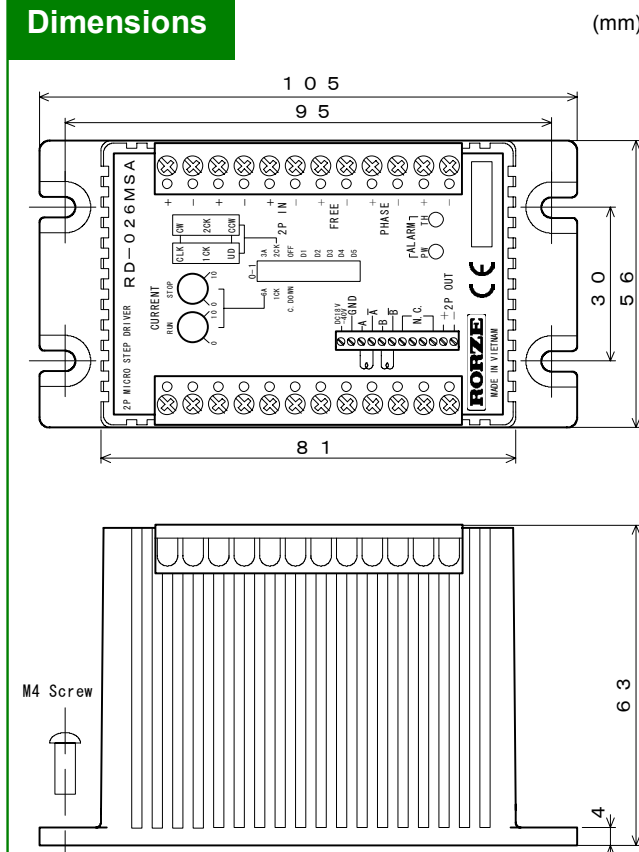
Input Circuits



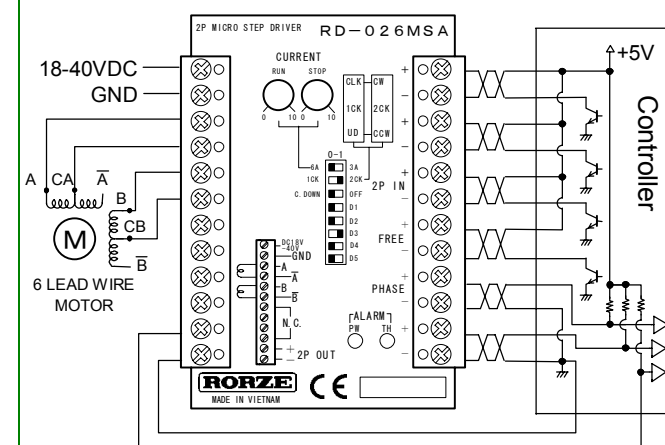
Output Circuits



Dimensions



Wiring Diagram



Lower heat generation
Lower vibration
Pulse input

2-PH Selectable Microstepping Motor Driver

RD-023MB

80,000 steps/rev. 12 to 50VDC



Features

- High speed rotation is available with the maximum power of 50VDC
- Lower heat generation with the new circuit system
- Lower vibration with high resolution microstep
- Photo-Isolated inputs and outputs
- Selectable clock – 1clk. or 2clk. Input
- Auto. current down (Adjustable stop current)

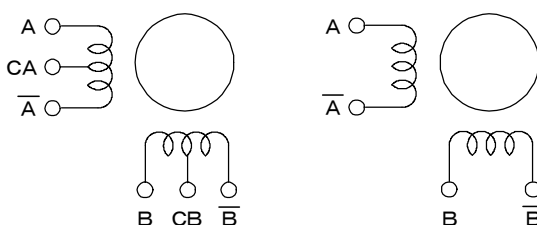
Specifications

Supply voltage	12 to 50VDC (including ripple)
Supply current	Approx. 1.2 times rated coil current of motor (max.)
Motor current	0.1 to 3A/phase
Drive method	Bipolar, constant current chopper method
Microstep resolution	Up to 400 microsteps/step Selections: 1, 2, 4, 8, 16, 32, 64, 2.5, 5, 10, 20, 40, 80, 160, 320, 6.25, 12.5, 25, 50, 100, 200, 400
Auto. current down	0 to 100% of the run current after about 0.3 seconds of inactivity according to Stop Current setting
Response frequency	500kpps max.
Protective circuitry	Over current and low supply voltage protection
Temperature range for operation	0 to +50°C (Dissipate heat to keep the driver's maximum case temperature below 65°C)
Humidity range for operation	Less than 85%RH (with no condensation)
Outside dimensions	22.6(H) × 105(W) × 65.6(D)mm
Weight	approx. 100g

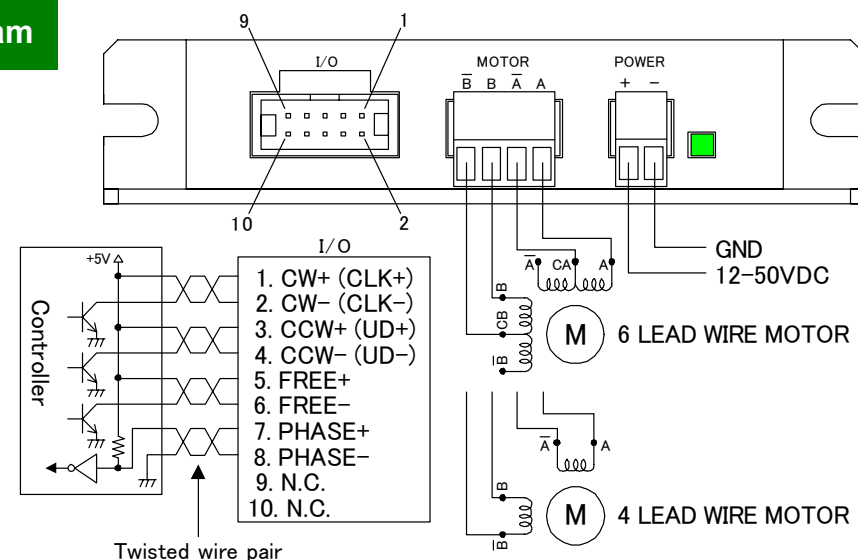
Suitable motors

Manufacturer	Model No.
RORZE Co.	RM2000 series, RM2C5648
OTHER	HB type (PM type) 2-ph stepping motor (4 or 6 lead wires)

Motor Wiring



Wiring Diagram



Functions

Clock inputs (CW/CLK, CCW/UD)

In case of using Two Clock Input (2CK)

CW+/- Motor rotates one step in CW direction with a pulse current from CW+ to CW- terminal.

CCW+/- Motor rotates one step in CCW direction with a pulse current from CCW+ to CCW- terminal.

In case of using One Clock Input (1CK)

CLK+/- & UD+/-

Motor rotates one step in CW direction with a pulse current from CLK+ to CLK- terminal and UD input off.

Motor rotates one step in CCW direction with a pulse current from CLK+ to CLK- terminal and UD input turned ON.

Free Input (FREE +/-)

The excitation current of motor will become 0 and a motor can be rotated by hand with a pulse current from "FREE+" to "FREE-".

PHASE Output (PHASE +/-)

PHASE output is turned ON at the phase home.

One pulse is put out every time the motor moves 7.2° in case of 1.8° motor.

POWER LED

This will light whenever the voltage is supplying.

Run Current Adjustment Rotary Switch

Rotary Switch to adjust the drive current.

Stop Current Adjustment Trimmer

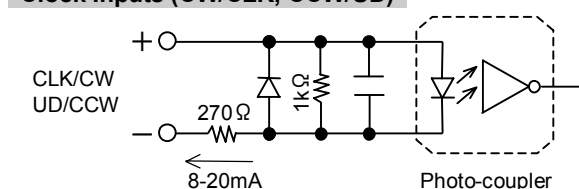
Trimmer to set the stop current to any value between 0 to 100% of the run current.

Dip Switches

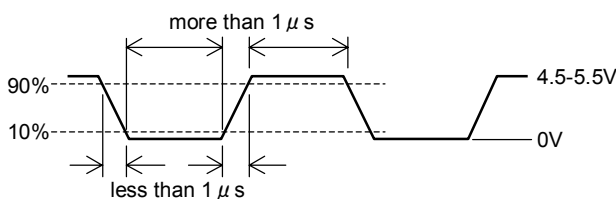
- 1) Select Current Range (H/L)
- 2) Select Clock Input (1CK/2CK)
- 3) Select Microstep Resolution (D1-D5)

Circuits

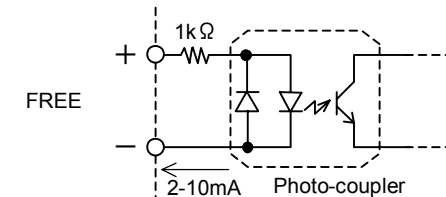
Clock Inputs (CW/CLK, CCW/UD)



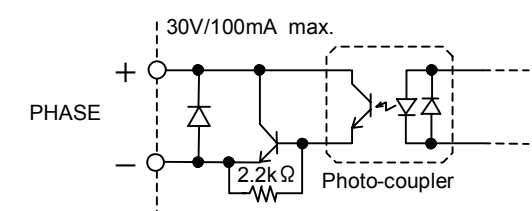
Clock Pulse Specification



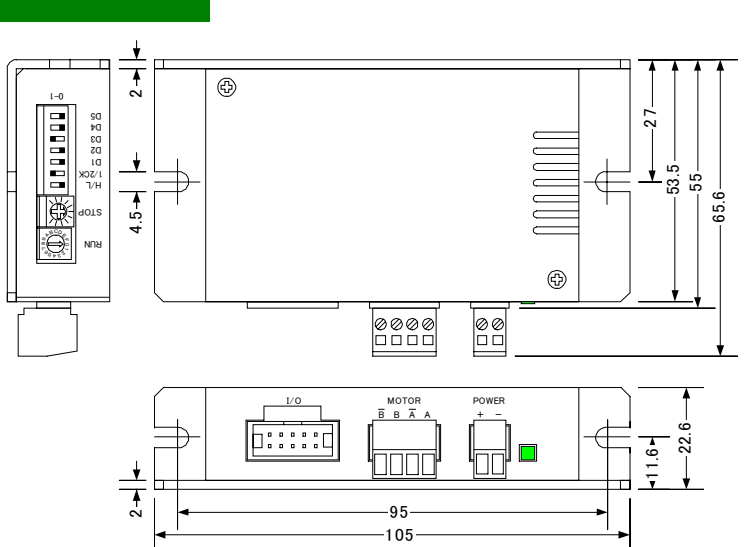
Input Circuits



Output Circuits



Dimensions



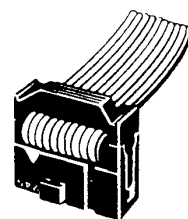
Option

No sockets for I/O ports will be provided with the driver.
Use the OMRON MIL connector (10 pins) for the connection.

Flat cables with socket are available as an option.

Flat cables with socket

Model	Length
RCC-10P50L	50cm
RCC-10P100L	100cm
RCC-10P200L	200cm
RCC-10P300L	300cm



High power
Lower heat generation
Lower vibration
Pulse input

2-PH Selectable Microstepping Motor Driver

RD-026MB

80,000 steps/rev. 18 to 50VDC



Features

- High speed rotation is available with the maximum power of 50VDC
- High power (6A/Phase max.)
- Lower heat generation with the new circuit system
- Lower vibration with high resolution microstep
- Photo-Isolated inputs and outputs
- Selectable clock – 1clk. or 2clk. Input
- Auto. current down (Adjustable stop current)

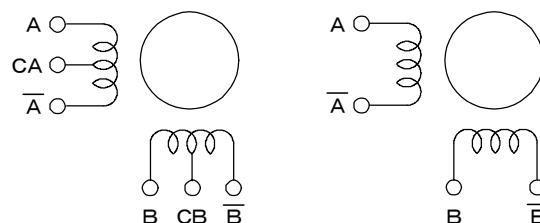
Specifications

Supply voltage	18 to 50VDC (including ripple)
Supply current	Approx. 1.2 times rated coil current of motor (max.)
Motor current	0.2 to 6A/phase
Drive method	Bipolar, constant current chopper method
Microstep resolution	Up to 400 microsteps/step Selections: 1, 2, 4, 8, 16, 32, 64, 2.5, 5, 10, 20, 40, 80, 160, 320, 6.25, 12.5, 25, 50, 100, 200, 400
Auto. current down	0 to 100% of the run current after about 0.3 seconds of inactivity according to Stop Current setting
Response frequency	500kpps max.
Protective circuitry	Over current and low supply voltage protection
Temperature range for operation	0 to +50°C (Dissipate heat to keep the driver's maximum case temperature below 65°C)
Humidity range for operation	Less than 85%RH (with no condensation)
Outside dimensions	22.6(H) × 105(W) × 65.6(D)mm
Weight	approx. 115g

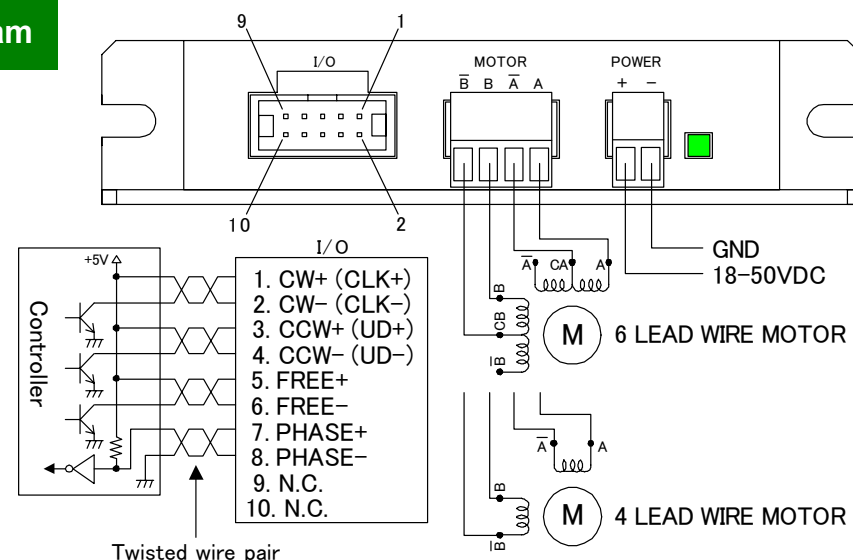
Suitable motors

Manufacturer	Model No.
RORZE Co.	RM2000 series, RM2C5675
OTHER	HB type (PM type) 2-ph stepping motor (4 or 6 lead wires)

Motor Wiring



Wiring Diagram



Functions

Clock inputs (CW/CLK, CCW/UD)

In case of using Two Clock Input (2CK)

CW+/- Motor rotates one step in CW direction with a pulse current from CW+ to CW- terminal.

CCW+/- Motor rotates one step in CCW direction with a pulse current from CCW+ to CCW- terminal.

In case of using One Clock Input (1CK)

CLK+/- & UD+/-

Motor rotates one step in CW direction with a pulse current from CLK+ to CLK- terminal and UD input off.

Motor rotates one step in CCW direction with a pulse current from CLK+ to CLK- terminal and UD input turned ON.

Free Input (FREE +/-)

The excitation current of motor will become 0 and a motor can be rotated by hand with a pulse current from "FREE+" to "FREE-".

PHASE Output (PHASE +/-)

PHASE output is turned ON at the phase home.

One pulse is put out every time the motor moves 7.2° in case of 1.8° motor.

POWER LED

This will light whenever the voltage is supplying.

Run Current Adjustment Rotary Switch

Rotary Switch to adjust the drive current.

Stop Current Adjustment Trimmer

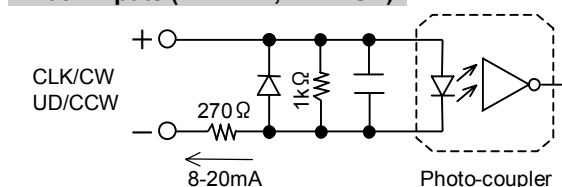
Trimmer to set the stop current to any value between 0 to 100% of the run current.

Dip Switches

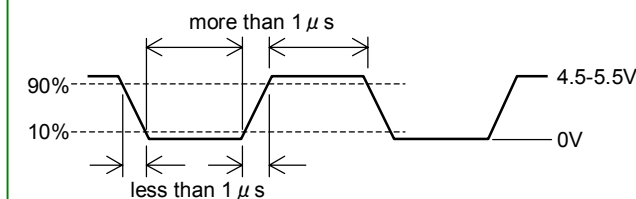
- 1) Select Current Range (H/L)
- 2) Select Clock Input (1CK/2CK)
- 3) Select Microstep Resolution (D1-D5)

Circuits

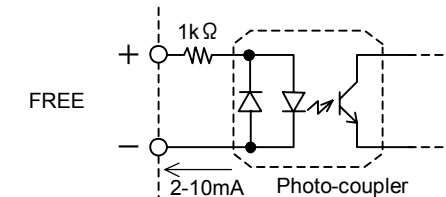
Clock Inputs (CW/CLK, CCW/UD)



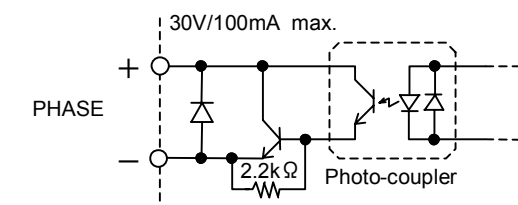
Clock Pulse Specification



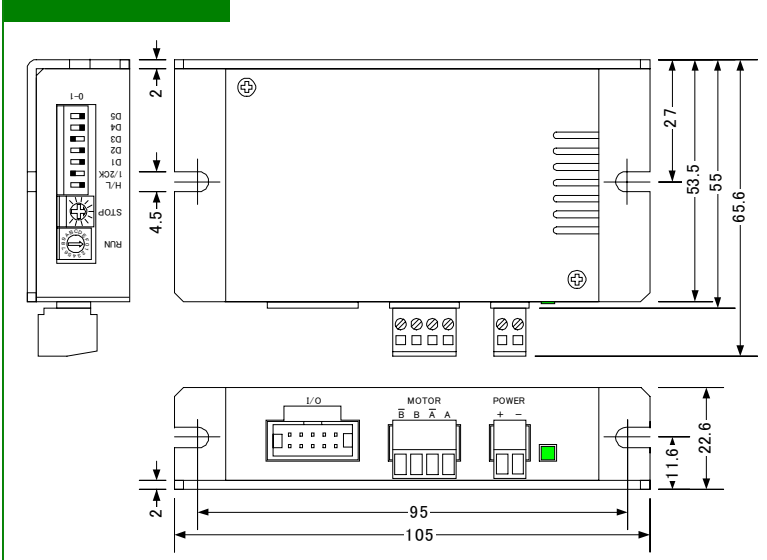
Input Circuits



Output Circuits



Dimensions



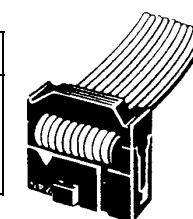
Option

No sockets for I/O ports will be provided with the driver.
Use the OMRON MIL connector (10 pins) for the connection.

Flat cables with socket are available as an option.

Flat cables with socket

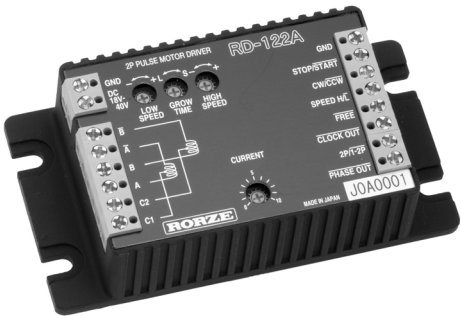
Model	Length
RCC-10P50L	50cm
RCC-10P100L	100cm
RCC-10P200L	200cm
RCC-10P300L	300cm



Compact
Built-in oscillator

2-PH Stepping Motor Driver

RD-122A



Features

- Built-in pulse oscillator
- FREE input to turn off excitation current of a motor
- PHASE OUT output for location of home for excitation timing
- Auto. current down

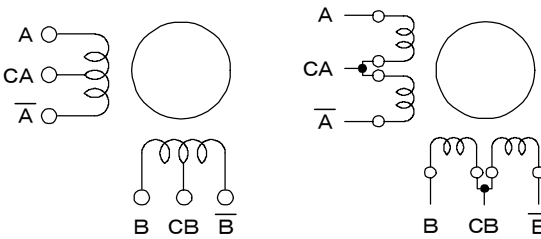
Specifications

Supply voltage	18 to 40VDC (including ripple)
Supply current	Approx. 2.4times rated coil current of motor (max.)
Motor current	0.3 to 1.3A/phase
Drive method	Unipolar, constant current chopper method
Excitation method	Full step (2P) or Half step (1-2P)
Auto. current down	50% of the rated current after about 0.3 seconds of inactivity
Oscillating frequency	Full step (2P) : 7kpps max. Half step (1-2P) : 14kpps max.
Speed change function	Digital (High/Low)
Accel./Decel. time	200msec to 2sec
Protective circuitry	Low voltage protection
Outside dimensions	27.5(H) × 105(W) × 56(D)mm
Weight	approx. 250g

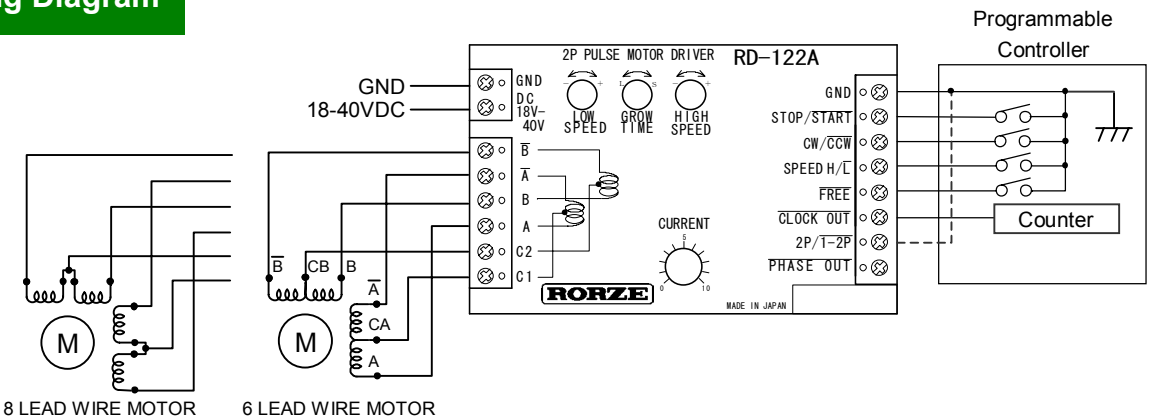
Suitable motors

Manufacturer	Model No.
RORZE Co.	RM2414, RM2424
OTHER	HB type (PM type) 2-ph stepping motor (6 lead wires)

Motor Wiring



Wiring Diagram



Functions

STOP/START (Input)

Turning STOP/START input to Low level (connecting to GND potential) will make the motor start to run.
Turning STOP/START input to High level (open) will make the motor stop.

CW/CCW (Input)

Turning CW/CCW to Low level (connecting to GND potential) will make the motor rotate in CCW direction.
Turning CW/CCW to High level (open) will make the motor rotate in CW direction.

SPEED H/L (Input)

This input is used for changing speed. Turning this SPEED H/L input terminal to High level (open) or Low level (connecting to GND potential) will change the frequency to the value set by Low Speed trimmer or High Speed trimmer.

FREE (Input)

Stepping motor drive current turns OFF at Low level (connects to GND potential) and the motor shaft can be rotated by hand.
When turning FREE input to High level (open) again, the motor is excited at the phase home.

CLOCK OUT (Output)

Terminal to output clock pulses. One pulse is put out every time a motor rotates one step.
The duty of output clock pulse is approx. 40 to 60%.

2P/1-2P (Input)

Motor rotates with 2-phase excitation (Full step) when this terminal is High level (open) and with 1-2phase excitation (Half step) when Low level (connects to GND potential).

PHASE OUT (Output)

PHASE OUT output is turned ON at the phase home.
Once every 4 steps in full step operation (or once every 8 steps in half step), one pulse is put out.

Current Adjustment Trimmer

Trimmer to adjust the drive current.

Grow Time Trimmer

Trimmer to set the acceleration and deceleration time.
Adjustable range is from 200msec. to 2sec.

High Speed Trimmer

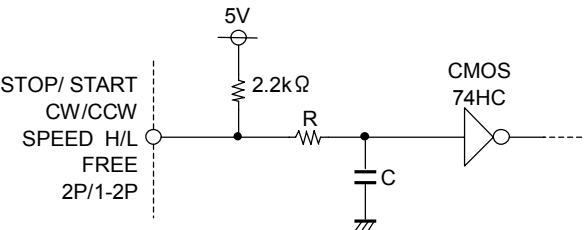
This trimmer is used for setting the high speed.

Low Speed Trimmer

This trimmer is used for setting the low speed.

Circuits

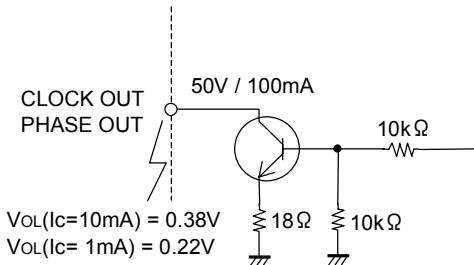
Input Circuits



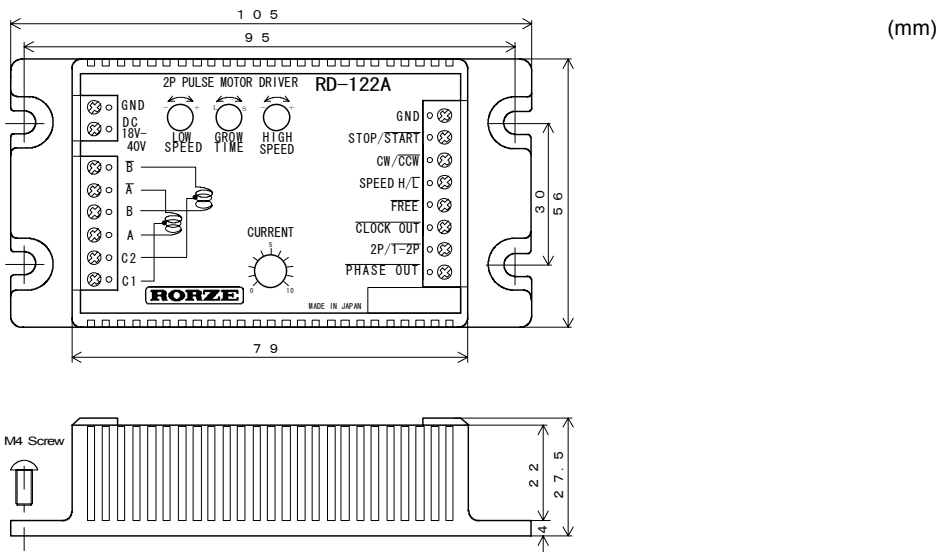
Low Level: Less than 1.5V
High Level: More than 3.5V

Terminal	R	C
STOP/START FREE 2P/1-2P	10kΩ	220pF
CW/CCW	2.2kΩ	220pF
SPEED H/L	10 kΩ	None

Output Circuits



Dimensions



Built-in oscillator
High power

2-PH Stepping Motor Driver

RD-123A(3A/Phase) RD-126A(6A/Phase)



Features

- Built-in pulse oscillator
- Can change RPM 16steps by SPEED terminals
- High power (RD-123A: 3A/Phase max. RD-126A: 6A/Phase max.)
- FREE input to turn off excitation current of a motor
- PHASE OUT output for location of home for excitation timing
- Auto. current down

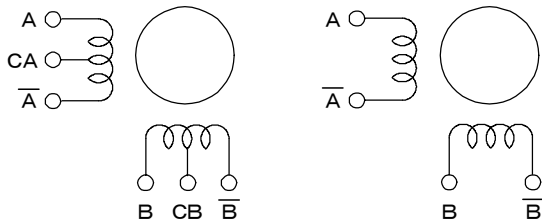
Specifications

Supply voltage	18 to 40VDC (including ripple)
Supply current	Approx. 2times rated coil current of motor (max.)
Motor current	RD-123A: 0.5 to 3A/phase RD-126A: 1 to 6A/phase
Drive method	Bipolar, constant current chopper method
Excitation method	Full step (2P) or Half step (1-2P)
Auto. current down	50% of the rated current after about 0.3 seconds of inactivity
Oscillating frequency	20kpps max.
Speed change function	Digital (16divisions by ABCD terminals)
Accel./Decel. time	15msec to 1,500msec
Protective circuitry	Overheating, over current, & low voltage protection
Outside dimensions	63(H) × 56(W) × 105(D)mm
Weight	approx. 500g

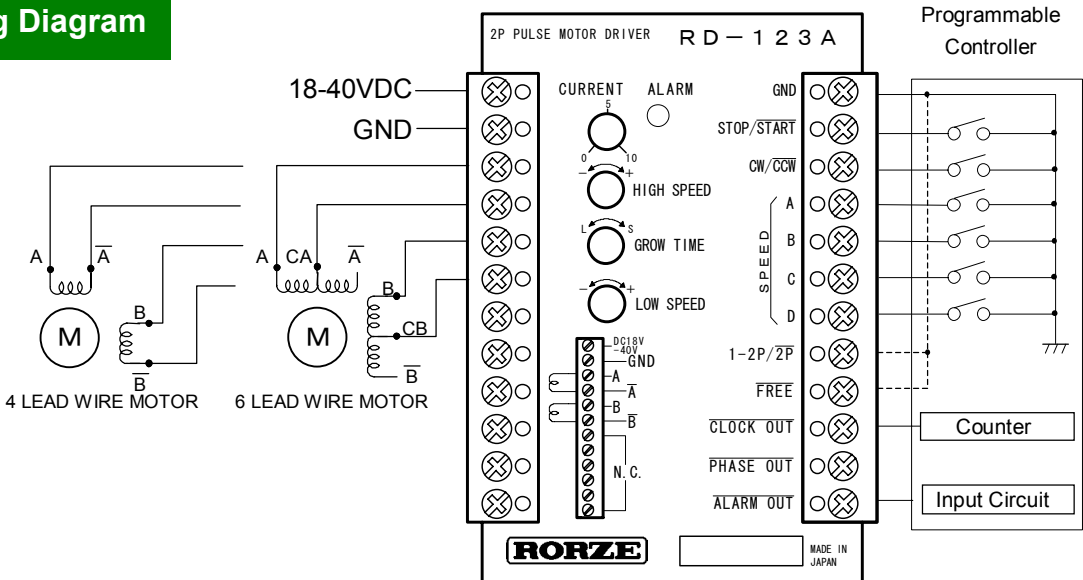
Suitable motors

Manufacturer	Model No.
RORZE Co.	RD-123A: RM24**, RM26** RD-126A: RM2000 series
OTHER	HB type (PM type) 2-ph stepping motor (4 or 6 lead wires)

Motor Wiring



Wiring Diagram



Functions

STOP/START (Input)

Turning STOP/START input to Low level (connecting to GND potential) will make the motor start to run.
Turning STOP/START input to High level (open) will make the motor stop.

CW/CCW (Input)

Turning CW/CCW to Low level (connecting to GND potential) will make the motor rotate in CCW direction.
Turning CW/CCW to High level (open) will make the motor rotate in CW direction.

SPEED A. B. C. D (Input)

These input terminals are used for setting RPM.
16 speeds are available between the highest and the lowest rpm setting by combination of signals from SPEED terminal ABCD.

1-2P/2P (Input)

Motor rotates with 1-2phase excitation (half step) when this terminal is High level (open) and with 2-phase excitation (Full step) when Low level (connects to GND potential).

FREE (Input)

Stepping motor drive current turns OFF at Low level (connects to GND potential) and the motor shaft can be rotated by hand.
When turning FREE input to High level (open) again, the motor is excited at the phase home.

CLOCK OUT (Output)

Terminal to output clock pulses. One pulse is put out every time a motor rotates one step.
Low level time is fixed to 20 μ sec.

PHASE OUT (Output)

PHASE OUT output is turned ON at the phase home.
Once every 4 steps in full step operation (or once every 8 steps in half step), one pulse is put out.

ALARM OUT (Output)

When the internal temperature of the driver reaches 75°C, ALARM OUT output is turned ON and ALARM LED will light.
Also, a motor will stop and auto. current down will work.
If the body temperature drops about 15°C below the triggered temperature, returns automatically.

ALARM LED

This will light when Overheating protection circuit is in operation.

Current Adjustment Trimmer

Trimmer to adjust the drive current.

Grow Time Trimmer

Trimmer to set the acceleration and deceleration time.
Adjustable range is from 15msec to 1,500 msec.

High Speed Trimmer

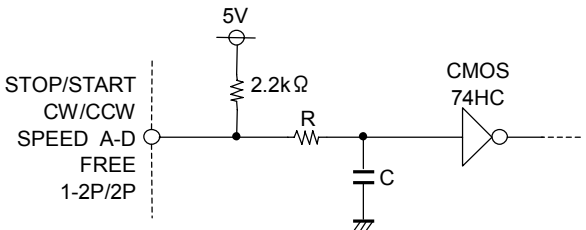
This trimmer is used for setting the high speed.

Low Speed Trimmer

This trimmer is used for setting the low speed.

Circuits

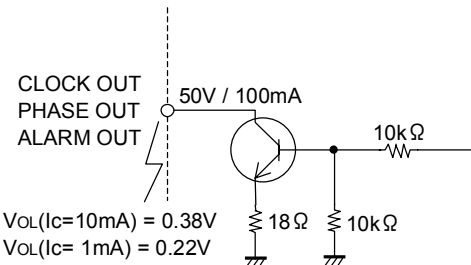
Input Circuits



Low Level: Less than 1.5V (Provided FREE is less than 0.8V)
High Level: More than 3.5V

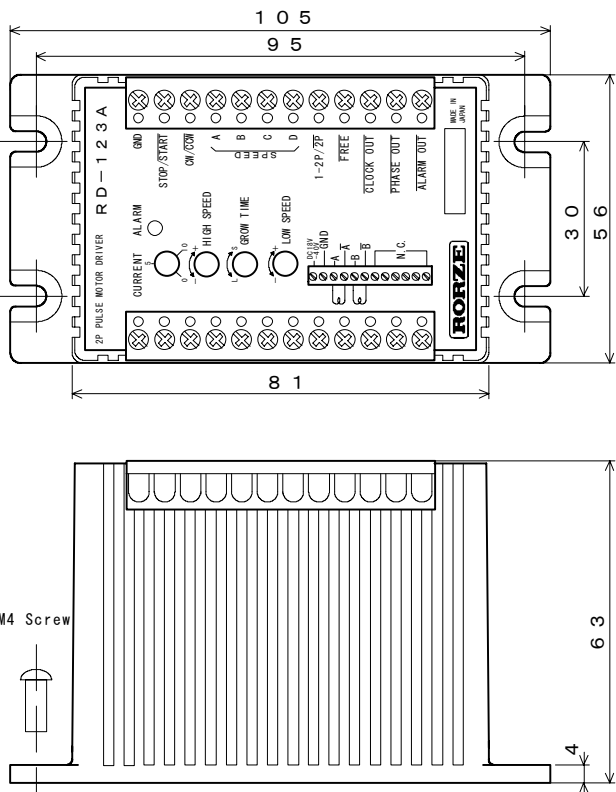
Terminal	R	C
STOP/START	10k Ω	1000pF
CW/CCW	2.2k Ω	1000pF
FREE	10 k Ω	None
SPEED A-D	10 k Ω	None

Output Circuits



$V_{OL}(I_C=10mA) = 0.38V$
 $V_{OL}(I_C=1mA) = 0.22V$

Dimensions



Built-in oscillator
High power

2-PH Stepping Motor Driver

RD-323A(3A/Phase) **RD-326A**(6A/Phase)



Features

- Built-in pulse oscillator
- Can set RPM by analog voltage of SPEED terminal
- High power (RD-323A: 3A/Phase max. RD-326A: 6A/Phase max.)
- FREE input to turn off excitation current of a motor
- PHASE OUT output for location of home for excitation timing
- Auto. current down

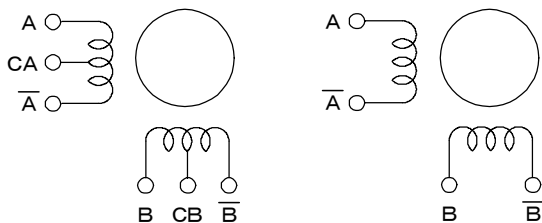
Specifications

Supply voltage	18 to 40VDC (including ripple)
Supply current	Approx. 2times rated coil current of motor (max.)
Motor current	RD-323A: 0.5 to 3A/phase RD-326A: 1 to 6A/phase
Drive method	Bipolar, constant current chopper method
Excitation method	Full step (2P) or Half step (1-2P)
Auto. current down	50% of the rated current after about 0.3 seconds of inactivity
Oscillating frequency	18kpps max.
Speed change function	Analog (Variable by analog voltage of SPEED terminal)
Accel./Decel. time	20msec to 3sec
Protective circuitry	Overheating, over current, & low voltage protection
Outside dimensions	63(H) × 56(W) × 105(D)mm
Weight	approx. 500g

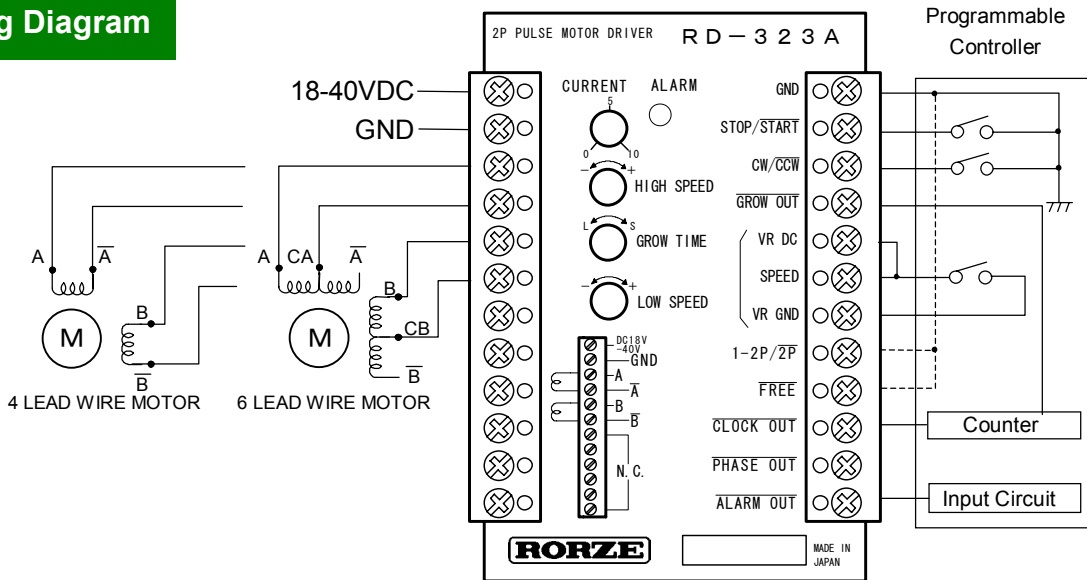
Suitable motors

Manufacturer	Model No.
RORZE Co.	RD-323A: RM24**, RM26** RD-326A: RM2000 series
OTHER	HB type (PM type) 2-ph stepping motor (4 or 6 lead wires)

Motor Wiring



Wiring Diagram



Functions

STOP/START (Input)

Turning STOP/START input to Low level (connecting to GND potential) will make the motor start to run.
Turning STOP/START input to High level (open) will make the motor stop.

CW/CCW (Input)

Turning CW/CCW to Low level (connecting to GND potential) will make the motor rotate in CCW direction.
Turning CW/CCW to High level (open) will make the motor rotate in CW direction.

GROW OUT (Output)

GROW OUT output is turned ON when the motor changes from a stationary state to the speed set at High Speed trimmer.
Therefore, by using the number of pulses from acceleration to GROW OUT output duration, it is possible to calculate deceleration time.
This feature makes the driver control only by setting total pulse using RC-204A/207A and RC-410.

VR DC (Output)

This output is used for supplying voltage to SPEED input.
The output is maintained at 9V with a 4.7kΩ pull-up resistor.

SPEED (Input)

This input is used for changing speed. By changing the SPEED input voltage from the voltage at VR GND (0V) to output voltage of VR DC (9V), you can adjust the frequency between the lowest and highest voltage set at Low Speed trimmer and High Speed trimmer.

VR GND

Use VR GND along with SPEED input for remote speed control.
As a good practice, use a shielded wire.

1-2P/2P (Input)

Motor rotates with 1-2phase excitation (half step) when this terminal is High level (open) and with 2-phase excitation (Full step) when Low level (connecting to GND potential).

FREE (Input)

Stepping motor drive current turns OFF at Low level (connects to GND potential) and the motor shaft can be rotated by hand.
When turning FREE input to High level (open) again, the motor is excited at the phase home.

CLOCK OUT (Output)

Terminal to output clock pulses. One pulse is put out every time a motor rotates one step.
The duty of output clock pulse is approx. 50%.

PHASE OUT (Output)

PHASE OUT output is turned ON at the phase home.
Once every 4 steps in full step operation (or once every 8 steps in half step), one pulse is put out.

ALARM OUT (Output)

When the internal temperature of the driver reaches 75°C, ALARM OUT output is turned ON and ALARM LED will light.
Also, a motor will stop and auto. current down will work.
If the body temperature drops about 15°C below the triggered temperature, returns automatically.

ALARM LED

This will light when Overheating protection circuit is in operation.

Current Adjustment Trimmer

Trimmer to adjust the drive current.

Grow Time Trimmer

Trimmer to set the acceleration and deceleration time.
Adjustable range is from 20msec to 3sec.

High Speed Trimmer

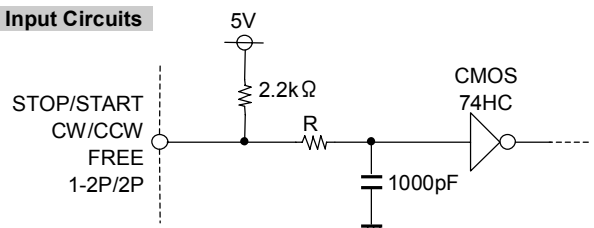
This trimmer is used for setting the high speed.

Low Speed Trimmer

This trimmer is used for setting the low speed.

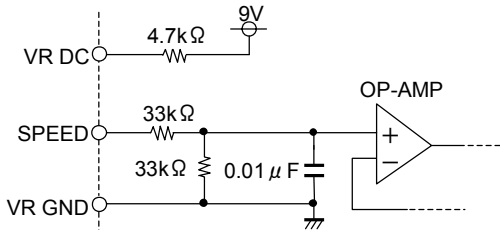
Circuits

Input Circuits

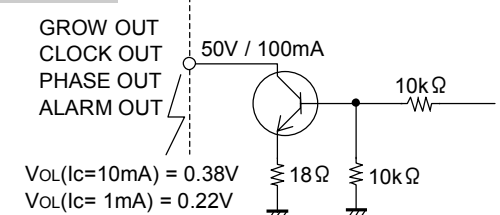


Low Level: Less than 1.5V (Provided FREE is less than 0.8V)
High Level: More than 3.5V

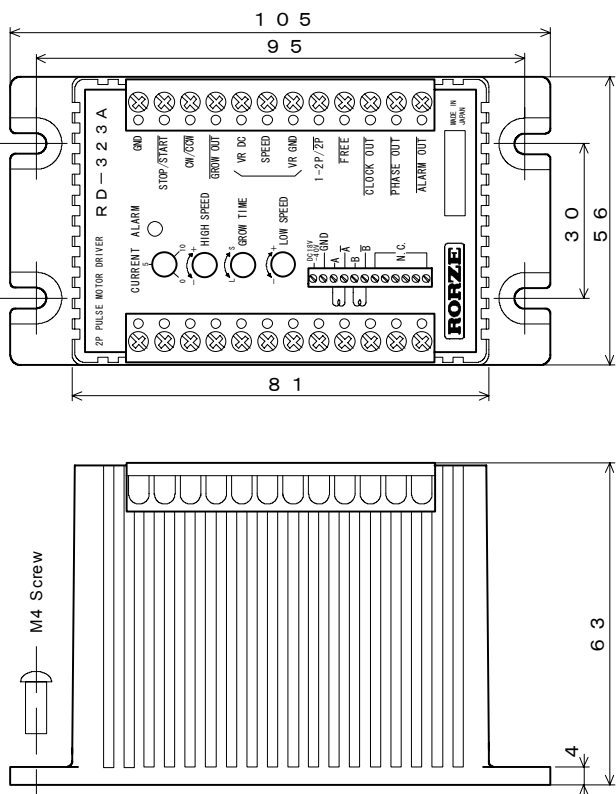
Terminal	R
STOP/START	10kΩ
CW/CCW	2.2kΩ
FREE	2.2kΩ
1-2P/2P	



Output Circuits



Dimensions

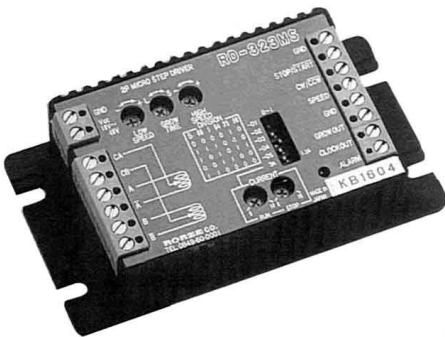


Compact
Lower vibration
Built-in oscillator

2-PH Selectable Microstepping Motor Driver

RD-323MS

16,000 steps/rev.



Features

- Built-in pulse oscillator
- Can set RPM by analog voltage of SPEED terminal
- Selectable microstep (50, 64, or 80 microsteps/step)
- Decreasing pulse output per basic step angle, can run in microstep mode without a high speed counter
- Selectable microstep (3 selections)
- Auto. current down (Adjustable stop current)

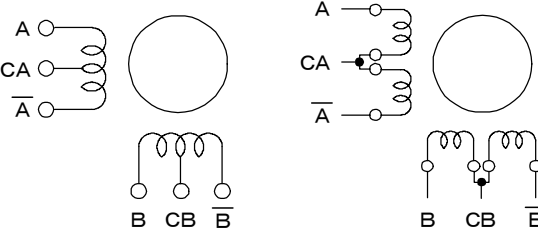
Specifications

Supply voltage		18 to 40VDC (including ripple)			
Supply current		Approx. 1.2times rated coil current of motor (max.)			
Motor current		0.3 to 3A/phase			
Drive method		Unipolar, constant current chopper method			
Resolution		Up to 80 microstep/step Selectable clockout 1 to 80 pulses/step			
		Microstep resolution	50	64	80
		Clockout resolution	25,50	1,2,4,8,16,32,64	5,10,20,40,80
Auto. current down		0 to 80% of the run current after about 0.3 seconds of inactivity according to Stop Current setting			
Oscillating frequency		700kpps max.			
Speed change function		Analog (Variable by analog voltage of SPEED terminal)			
Accel./Decel. time		20msec to 3sec			
Protective circuitry		Overheating, over current, & low voltage protection			
Outside dimensions		27.5(H) × 105(W) × 56(D)mm			
Weight		approx. 250g			

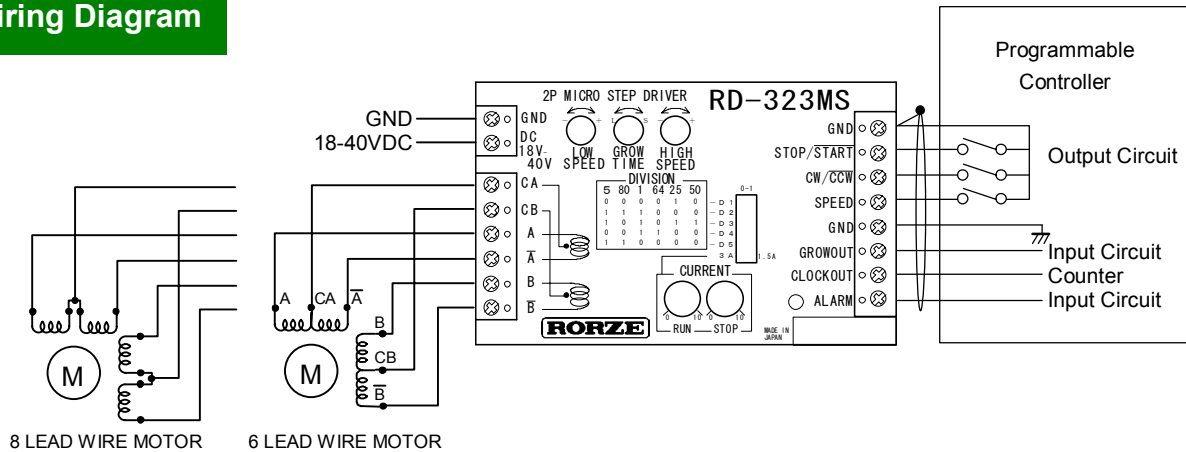
Suitable motors

Manufacturer	Model No.
RORZE Co.	RM24**, RM26**
OTHER	HB type (PM type) 2-ph stepping motor (6 lead wires)

Motor Wiring



Wiring Diagram



Functions

STOP/START (Input)

Turning STOP/START input to Low level (connecting to GND potential) will make the motor start to run.
Turning STOP/START input to High level (open) will make the motor stop.

CW/CCW (Input)

Turning CW/CCW to Low level (connecting to GND potential) will make the motor rotate in CCW direction.
Turning CW/CCW to High level (open) will make the motor rotate in CW direction.

SPEED (Input)

This input is used for changing speed. A voltage input between 0 to 5Vdc would change the speed from low speed to high speed. The input is maintained at 5Vdc with a 4.7kΩ pull-up resistor.

GROW OUT (Output)

GROW OUT output is turned ON when the motor changes from a stationary state to the speed set at High Speed trimmer. Therefore, by using the number of pulses from acceleration to GROW OUT output duration, it is possible to calculate deceleration time.
This feature makes the driver control only by setting total pulse using RC-204A/207A and RC-410.

CLOCK OUT (Output)

The CLOCK OUT is clock pulse output terminal.
You can select output pulse from among 1 to 80 pulses/step by using dip switches.
The duty of output clock pulse is approx. 40 to 60%.

ALARM (Output)

When the internal temperature of the driver reaches about 70°C, ALARM output is turned ON and ALARM LED will light. Also, a motor will stop and auto. current down will work. If the body temperature drops about 10°C below the triggered temperature, returns automatically.

ALARM LED

This will light when Overheating protection circuit is in operation.

Run Current Adjustment Trimmer

Trimmer to adjust the drive current.

Stop Current Adjustment Trimmer

Trimmer to set the stop current to any value between 0 to 80% of the run current.

Grow Time Trimmer

Trimmer to set the acceleration and deceleration time. Adjustable range is from 20msec to 3sec.

High Speed Trimmer

This trimmer is used for setting the high speed.

Low Speed Trimmer

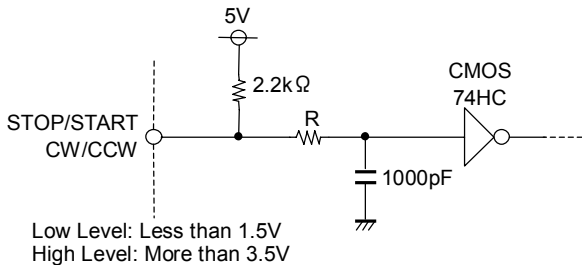
This trimmer is used for setting the low speed.

Dip Switches

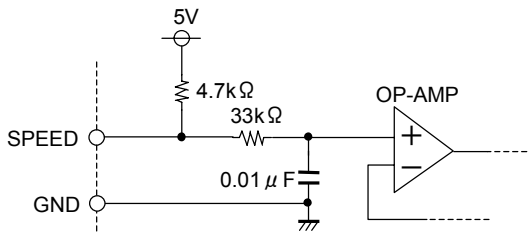
- 1) Select Microstep/Clockout Resolution
- 2) Select Current Range (3A/1.5A)

Circuits

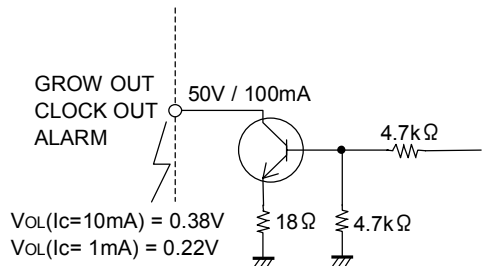
Input Circuits



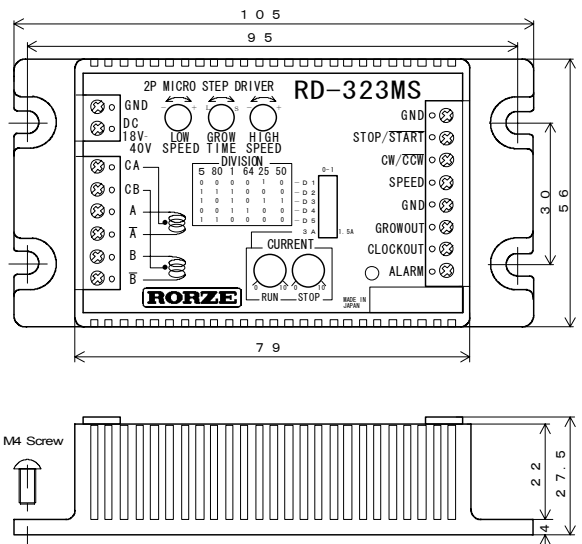
Terminal	R
STOP/START	10kΩ
CW/CCW	2.2kΩ



Output Circuits



Dimensions



Built-in oscillator
Lower vibration
High endurance
of voltage
High power

2-PH Microstepping Motor Driver

RD-323M10HA RD-323M50HA (3A/Phase)

RD-326M10A RD-326M50A (6A/Phase)



Features

- Built-in pulse oscillator
- Can set RPM by analog voltage of SPEED terminal
- High speed rotation is available with the maximum power of 80VDC (RD-323M**HA)
- High power (RD-323M**HA: 3A/Phase max. RD-326M**A: 6A/Phase max.)
- FREE input to turn off excitation current of a motor
- Auto. current down

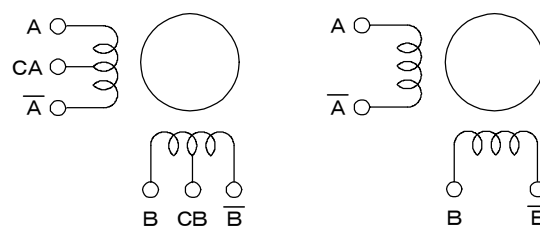
Specifications

Supply voltage	RD-323M**HA: 18 to 80VDC (including ripple) RD-326M**A: 18 to 40VDC (including ripple)
Supply current	Approx. 2times rated coil current of motor (max.)
Motor current	RD-323M**HA: 0.5 to 3A/phase RD-326M**A: 1 to 6A/phase
Drive method	Bipolar, constant current chopper method
Microstep resolution	M10: 10 microsteps/step M50: 50 microsteps/step
Auto. current down	50% of the rated current after about 0.3 seconds of inactivity
Oscillating frequency	M10: 160kpps max. M50: 600kpps max.
Speed change function	Analog (Variable by analog voltage of SPEED terminal)
Accel./Decel. time	20msec to 3sec
Protective circuitry	Overheating, over current, & low voltage protection
Outside dimensions	63(H) × 56(W) × 105(D)mm
Weight	approx. 580g

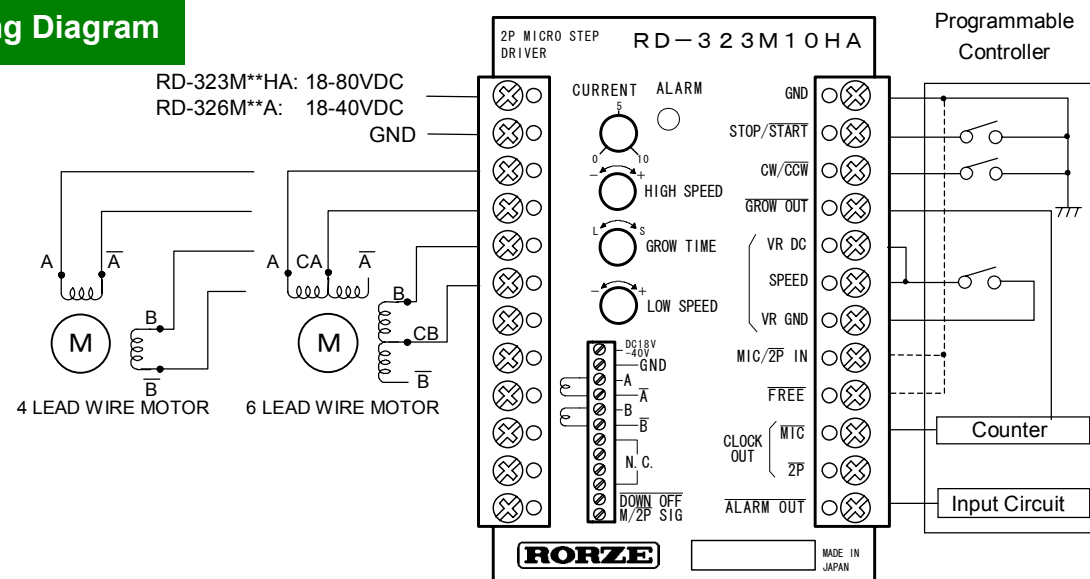
Suitable motors

Manufacturer	Model No.
RORZE Co.	RD-323M**HA: RM24**, RM26** RM2C5648
	RD-326M**A: RM2000 series RM2C5675
OTHER	HB type (PM type) 2-ph stepping motor (4 or 6 lead wires)

Motor Wiring



Wiring Diagram



Functions

STOP/START (Input)

Turning STOP/START input to Low level (connecting to GND potential) will make the motor start to run.
Turning STOP/START input to High level (open) will make the motor stop.

CW/CCW (Input)

Turning CW/CCW to Low level (connecting to GND potential) will make the motor rotate in CCW direction.
Turning CW/CCW to High level (open) will make the motor rotate in CW direction.

GROW OUT (Output)

GROW OUT output is turned ON when the motor changes from a stationary state to the speed set at High Speed trimmer. Therefore, by using the number of pulses from acceleration to GROW OUT output duration, it is possible to calculate deceleration time.
This feature makes the driver control only by setting total pulse using RC-204A/207A and RC-410.

VR DC (Output)

This output is used for supplying voltage to SPEED input. The output is maintained at 9V with a 4.7kΩ pull-up resistor.

SPEED (Input)

This input is used for changing speed. By changing the SPEED input voltage from the voltage at VR GND (0V) to output voltage of VR DC (9V), you can adjust the frequency between the lowest and highest voltage set at Low Speed trimmer and High Speed trimmer.

VR GND

Use VR GND along with SPEED input for remote speed control. As a good practice, use a shielded wire.

MIC/2P IN (Input)

When this terminal is High level (open), CLOCK OUT/MIC terminal outputs the clock pulse equivalent to a micro step.
When this terminal is Low level (connects to GND potential), CLOCK OUT/MIC terminal outputs the clock pulse equivalent to a full step.

FREE (Input)

Stepping motor drive current turns OFF at Low level (connects to GND potential) and the motor shaft can be rotated by hand.
When turning FREE input to High level (open) again, the motor is excited at the phase home.

CLOCK OUT/MIC (Output)

This is a clock pulse output terminal. This outputs clock pulses for microstep or full step. This can be determined by MIC/2P IN.

CLOCK OUT/2P OUT (Output)

This outputs pulses equivalent to full step. (One pulse is put out every time the motor move 1.8° in case of 1.8° motor.)
Pulse width being CLOCK OUT/2P output (open collector output) ON varies depending on pulse frequency, but it doesn't become 20μsec or less.

ALARM OUT (Output)

When the internal temperature of the driver reaches 70°C, ALARM OUT output is turned ON and ALARM LED will light. Also, a motor will stop and auto. current down will work.
If the body temperature drops about 10°C below the triggered temperature, returns automatically.

DOWN OFF (Input)

Turning this terminal to Low level (connecting to GND potential) overrides the current down circuit and holds the motor stationary with full current.

M/2P SIG (Output)

This terminal signals whether output from CLOCK OUT/MIC is full step or microstep clockout.

ALARM LED

This will light when Overheating protection circuit is in operation.

Current Adjustment Trimmer

Trimmer to adjust the drive current.

Grow Time Trimmer

Trimmer to set the acceleration and deceleration time. Adjustable range is from 20msec to 3sec.

High Speed Trimmer

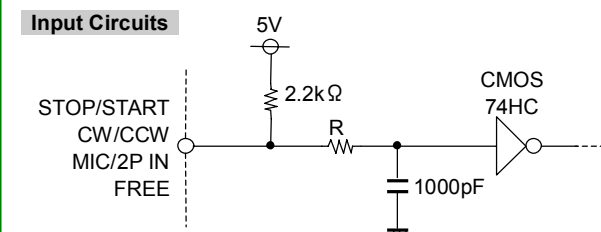
This trimmer is used for setting the high speed.

Low Speed Trimmer

This trimmer is used for setting the low speed.

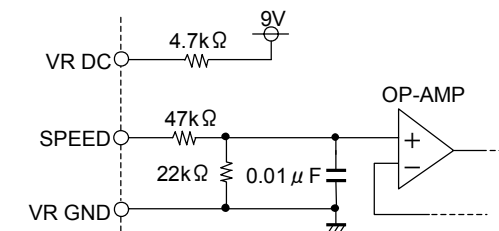
Circuits

Input Circuits

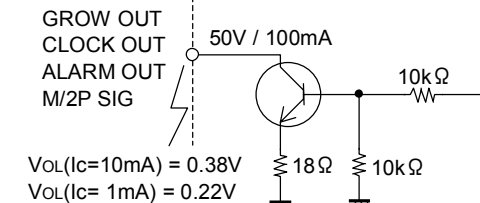


Low Level: Less than 1.5V (Provided FREE is less than 0.8V)
High Level: More than 3.5V

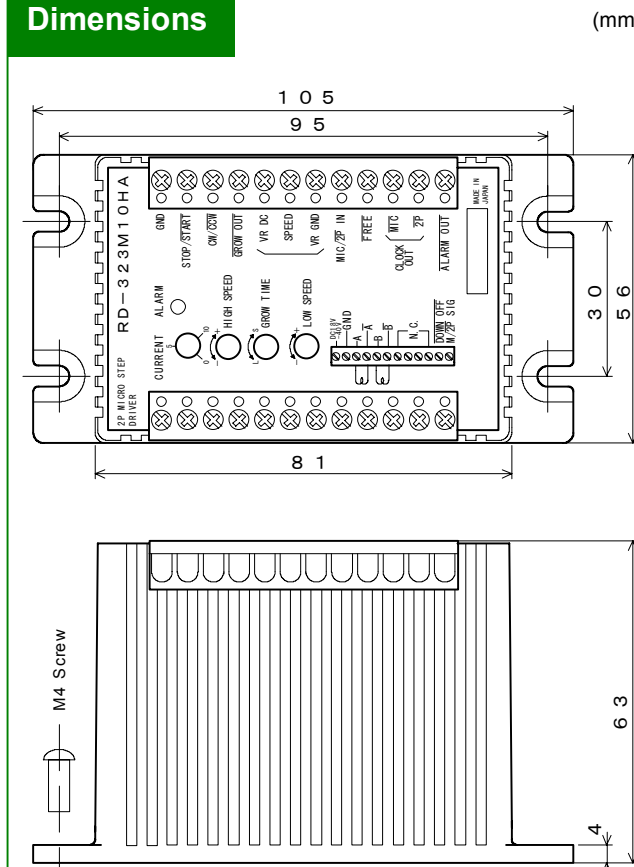
Terminal	R
STOP/START	10kΩ
CW/CCW	
FREE	2.2kΩ
MIC/2P IN	



Output Circuits



Dimensions



Pulse input

5-PH Stepping Motor Driver

RD-053A(2CK Input Type) RD-053NA(1CK Input Type)



Features

- FREE input to turn off excitation current of a motor
- PHASE OUT output for location of home for excitation timing
- Auto. current down

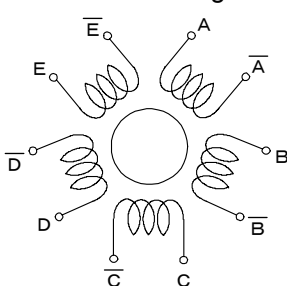
Specifications

Supply voltage	18 to 40VDC (including ripple)
Supply current	Approx. 2times rated coil current of motor (max.)
Motor current	0.5 to 3A/phase
Drive method	Bipolar, constant current chopper method
Excitation method	Full step (4P) or Half step (4-5P)
Auto. current down	50% of the rated current after about 0.3 seconds of inactivity
Response frequency	200kpps max.
Protective circuitry	Overheating, over current, & low voltage protection
Outside dimensions	63(H) × 56(W) × 105(D)mm
Weight	approx. 580g

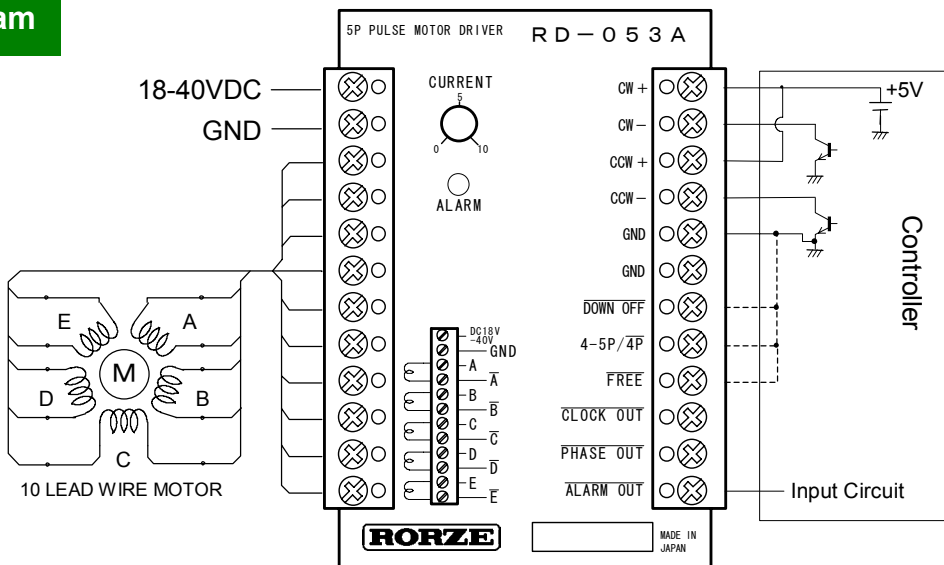
Suitable motors

Manufacturer	Model No.
RORZE Co.	RM5000 series
OTHER	HB type (PM type) 5-ph stepping motor (10 lead wires)

Motor Wiring



Wiring Diagram



Functions

Clock inputs (CW(CLOCK), CCW)

RD-053A

CW+/- Motor rotates one step in CW direction with a pulse current from CW+ to CW- terminal.

CCW+/- Motor rotates one step in CCW direction with a pulse current from CCW+ to CCW- terminal.

RD-053NA

CLOCK+/- & CCW+/-

Motor rotates one step in CW direction with a pulse current of from CLOCK+ to CLOCK- terminal and CCW input OFF.

Motor rotates one step in CCW direction with a pulse current from CLOCK+ to CLOCK- terminal and CCW input turned ON.

DOWN OFF (Input)

Turning this terminal to Low level (connecting to GND potential) overrides the current down circuit and holds the motor stationary with full current.

4-5P/4P (Input)

Motor rotates with 4-5phase excitation (half step) when this terminal is High level (open) and with 4-phase excitation (Full step) when Low level (connects to GND potential).

FREE (Input)

Stepping motor drive current turns OFF at Low level (connects to GND potential) and the motor shaft can be rotated by hand. When turning FREE input to High level (open) again, the motor is excited at the phase home.

CLOCK OUT (Output)

Outputs clock pulses input to Clock input terminal CW(CLOCK), CCW.

PHASE OUT (Output)

PHASE OUT output is turned ON at the phase home. Once every 10 steps in full step operation (or once every 20 steps in half step), one pulse is put out.

ALARM OUT (Output)

When the internal temperature of the driver reaches 75°C, ALARM OUT output is turned ON and ALARM LED will light. Also, a motor will stop and auto. current down will work. If the body temperature drops about 15°C below the triggered temperature, returns automatically.

ALARM LED

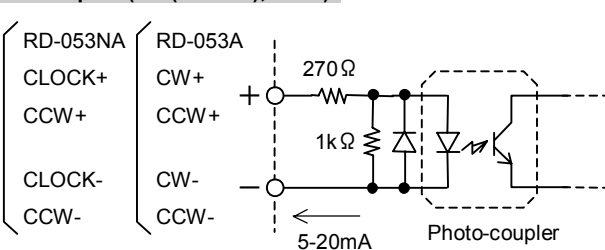
This will light when Overheating protection circuit is in operation.

Current Adjustment Trimmer

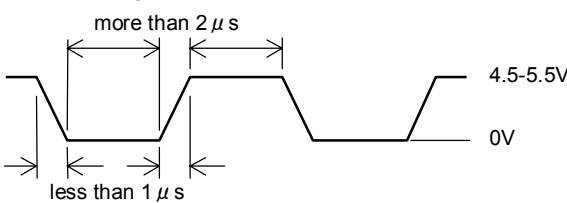
Trimmer to adjust the drive current.

Circuits

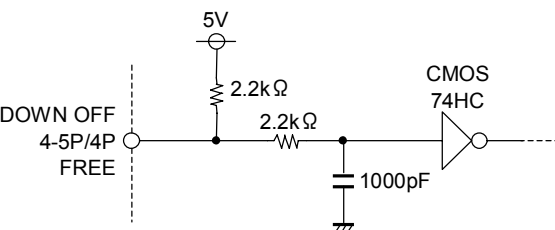
Clock Inputs (CW(CLOCK), CCW)



Clock Pulse Specification

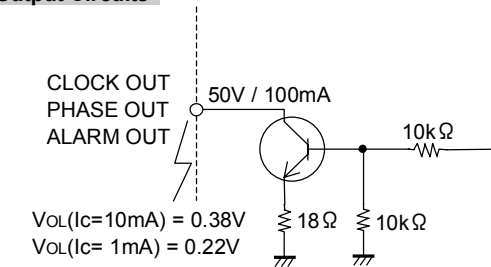


Input Circuits

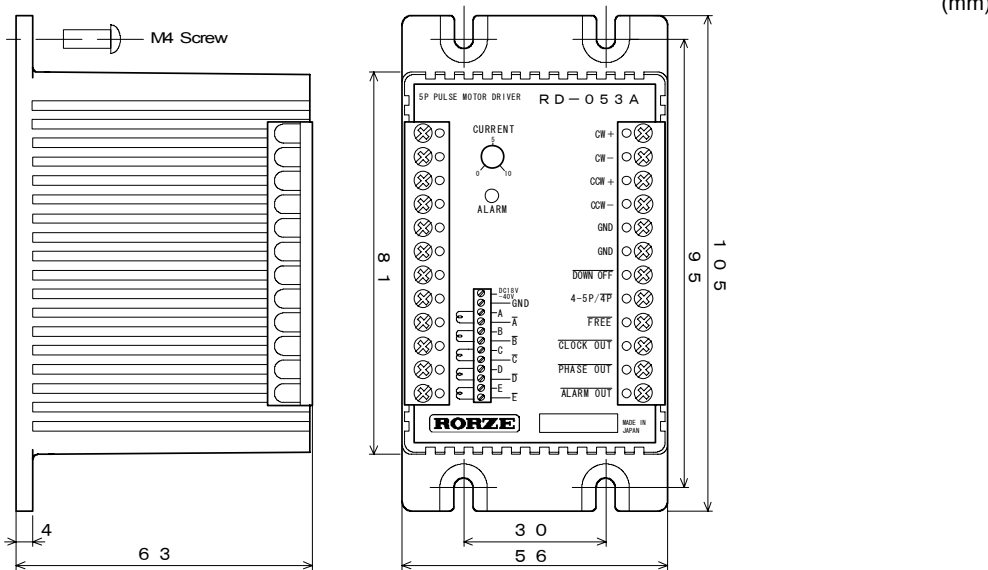


Low Level: Less than 1.5V (Provided FREE is less than 0.8V)
High Level: More than 3.5V

Output Circuits



Dimensions

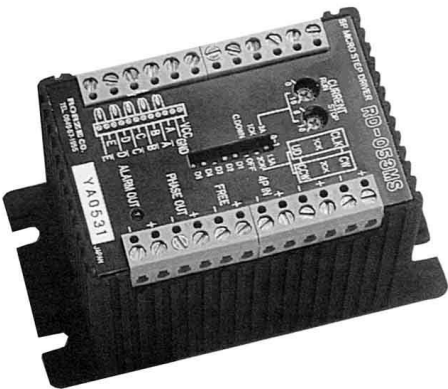


Lower vibration
Pulse input

5-PH Selectable Microstepping Motor Driver

RD-053MS

200,000 steps/rev.



Features

- Lower vibration with high resolution microstep
- Selectable microstep (22 selections)
- Photo-Isolated inputs and outputs
- Selectable clock – 1clk. or 2clk. Input
- Auto. current down (Adjustable stop current)

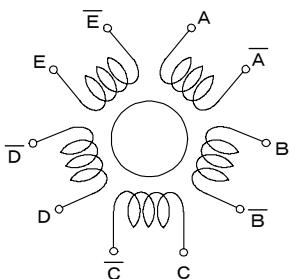
Specifications

Supply voltage	18 to 40VDC (including ripple)
Supply current	Approx. 2times rated coil current of motor (max.)
Motor current	0.5 to 3A/phase
Drive method	Bipolar, constant current chopper method
Microstep resolution	Up to 400 microsteps/step Selections: 1,2,4,8,16,32,64,2.5,5,10,20,40,80,160,320,6.25,12.5,25,50,100,200,400
Auto. current down	0 to 80% of the run current after about 0.3 seconds of inactivity according to Stop Current setting
Response frequency	500kpps max.
Protective circuitry	Overheating, over current, & low voltage protection
Outside dimensions	63(H) × 56(W) × 105(D)mm
Weight	approx. 580g

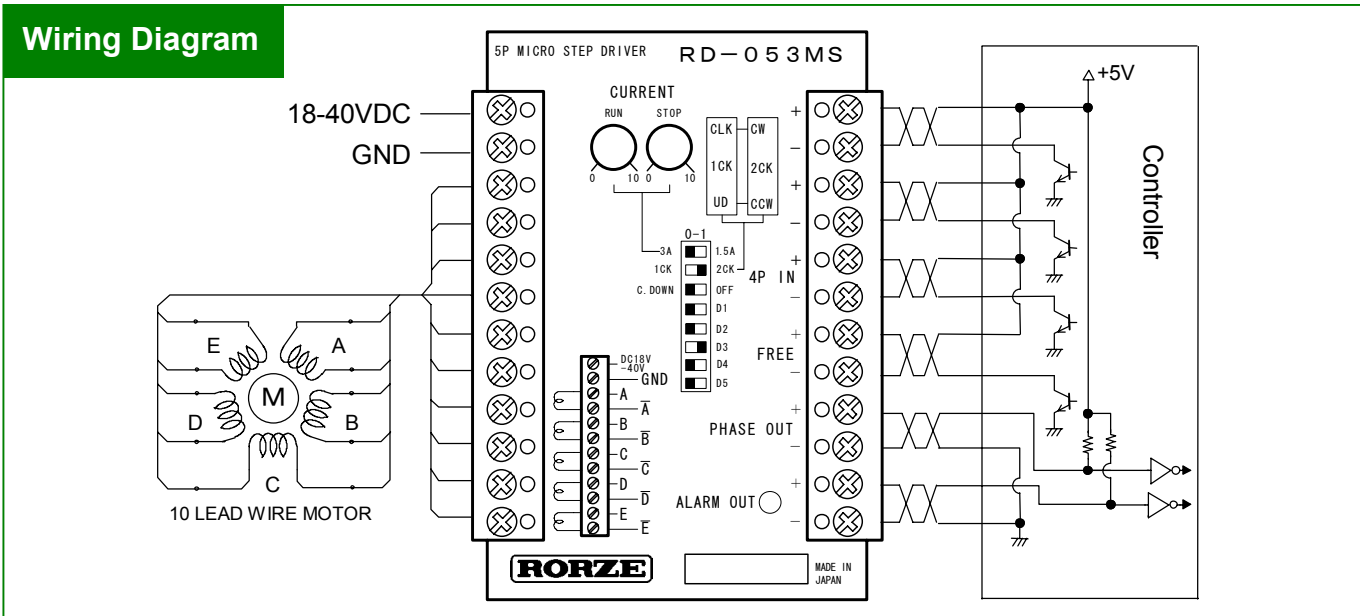
Suitable motors

Manufacturer	Model No.
RORZE Co.	RM5000 series
OTHER	HB type (PM type) 5-ph stepping motor (10 lead wires)

Motor Wiring



Wiring Diagram



Functions

Clock inputs (CW/CLK, CCW/UD)

In case of using Two Clock Input (2CK)

CW+/- Motor rotates one step in CW direction with a pulse current from CW+ to CW- terminal.

CCW+/- Motor rotates one step in CCW direction with a pulse current from CCW+ to CCW- terminal.

In case of using One Clock Input (1CK)

CLK+/- & UD+/-

Motor rotates one step in CW direction with a pulse current from CLK+ to CLK- terminal and UD input off.

Motor rotates one step in CCW direction with a pulse current from CLK+ to CLK- terminal and UD input turned ON.

Full Step Input (4P IN +/-)

Motor rotates in full step mode with a pulse current from "4P IN +" to "4P IN -".

Free Input (FREE +/-)

The excitation current of motor will become 0 and a motor can be rotated by hand with a pulse current from "FREE+" to "FREE-".

Phase Output (PHASE OUT +/-)

PHASE OUT output is turned ON at the phase home. One pulse is put out every time the motor moves 7.2° in case of 0.72° motor.

Alarm Output (ALARM OUT +/-)

When the internal temperature of the driver reaches about 75°C, ALARM OUT output is turned ON and ALARM LED will light. Also, a motor will stop and auto. current down will work. If the body temperature drops about 15°C below the triggered temperature, returns automatically.

ALARM LED

This will light when Overheating protection circuit is in operation.

Run Current Adjustment Trimmer

Trimmer to adjust the drive current.

Stop Current Adjustment Trimmer

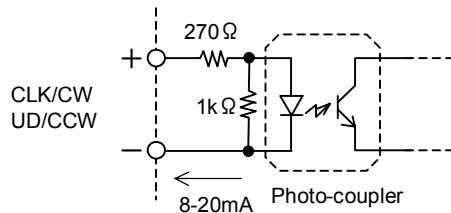
Trimmer to set the stop current to any value between 0 to 80% of the run current.

Dip Switches

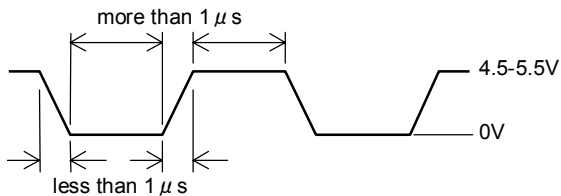
- 1) Select Current Range (3A/1.5A)
- 2) Select Clock Input (1CK/2CK)
- 3) Select Auto. Current Down
- 4) Select Microstep Resolution

Circuits

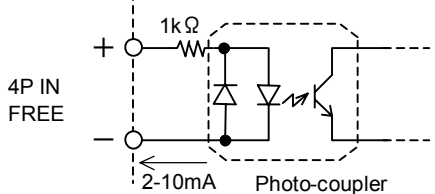
Clock Inputs (CW/CLK, CCW/UD)



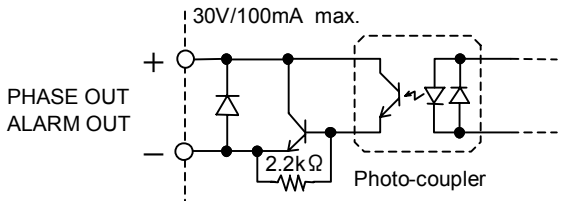
Clock Pulse Specification



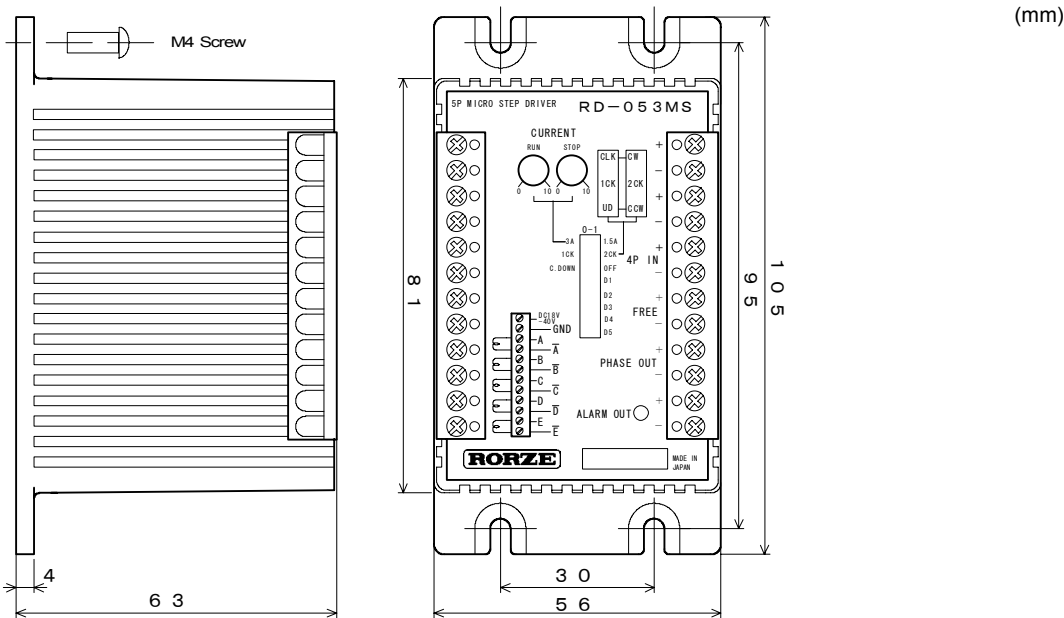
Input Circuits



Output Circuits



Dimensions

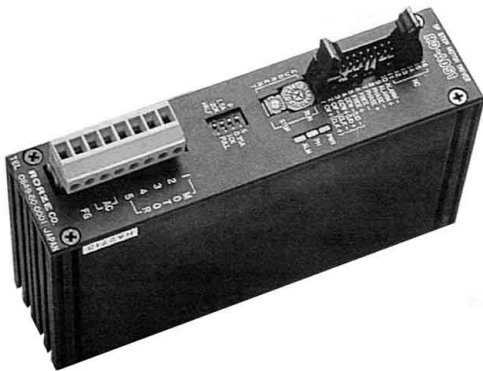


Compact
Low cost
Pulse input

5-PH Stepping Motor Driver

RD-A051

Full/Half step 100VAC



Features

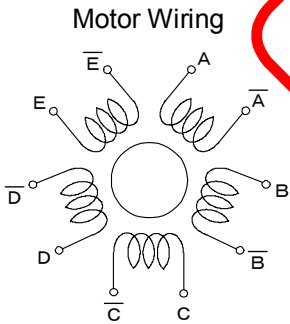
- 40mm thin!
- Aluminum alloy heat sink for heat dissipation
- Integrated power supply with 100VAC input
- Photo-Isolated inputs and outputs
- Selectable clock – 1clk. or 2clk. Input
- Auto. current down (Adjustable stop current)

Specifications

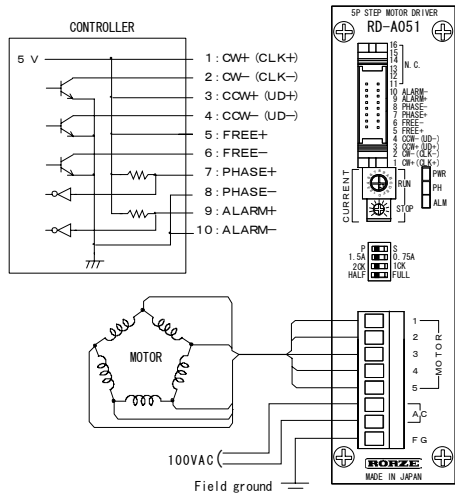
Supply voltage	100 to 115VAC±10%
Supply current	4A max.
Motor current	0.2 to 1.5A/phase
Drive method	Bipolar, constant current chopper with standard or pentagon wiring
Excitation method	Full step or Half step
Auto. current down	0 to 80% of the run current after about 0.3 seconds of inactivity according to Stop Current setting
Response frequency	200kpps max.
Protective circuitry	Overheating, over current, & low voltage protection
Withstand voltage	1,000V or more
Outside dimensions	84(H) × 40(W) × 155(D)mm
Weight	approx. 1,000g

Suitable motors

Manufacturer	Model No.
RORZE Co.	RM5407, RM5411, RM5414
OTHER	HB type (PM type) 5-ph stepping motor (10 lead wires)



Wiring Diagram



Functions

Clock inputs (CW/CLK, CCW/UD)

In case of using Two Clock Input (2CK)

CW+/- Motor rotates one step in CW direction with a pulse current from CW+ to CW- terminal.

CCW+/- Motor rotates one step in CCW direction with a pulse current from CCW+ to CCW- terminal.

In case of using One Clock Input (1CK)

CLK+/- & UD+/-

Motor rotates one step in CW direction with a pulse current from CLK+ to CLK- terminal and UD input off.

Motor rotates one step in CCW direction with a pulse current from CLK+ to CLK- terminal and UD input turned ON.

Free Input (FREE +/-)

The excitation current of motor will become 0 and a motor can be rotated by hand with a pulse current of from "FREE+" to "FREE-".

Phase Output (PHASE +/-)

PHASE output is turned ON at the phase home.

Once every 10 steps in full step operation (or once every 20 steps in half step), one pulse is put out.

Alarm Output (ALARM +/-)

When the internal temperature of the driver reaches 80°C±4°C, ALARM output is turned ON and ALARM LED will light. Also, a motor will stop and auto. current down will work. If the body temperature drops about 10°C below the triggered temperature, returns automatically.

POWER LED

This will light whenever the voltage is supplying.

PHASE LED

This will light when excitation of coil stands by at home phase.

ALARM LED

This will light when Overheating protection circuit is in operation.

Run Current Adjustment Switch

Switch to adjust the drive current.

Stop Current Adjustment Trimmer

Trimmer to set the stop current to any value between 0 to 80% of the run current.

Dip Switches

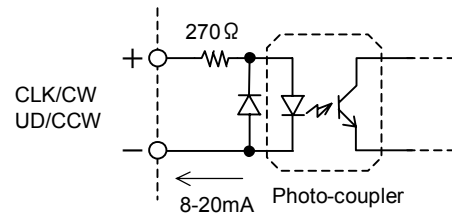
- 1) Select Excitation method (HALF/FULL)
- 2) Select Clock Input (2CK/1CK)
- 3) Select Current Range (1.5A/0.75A)
- 4) Select Drive method (P/S)

FG terminal

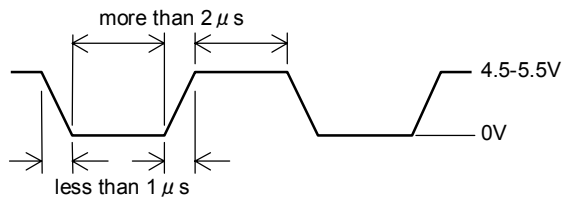
Use AWG 20 or less (greater than 0.5mm²) wire for connecting FG terminal to Field ground.

Circuits

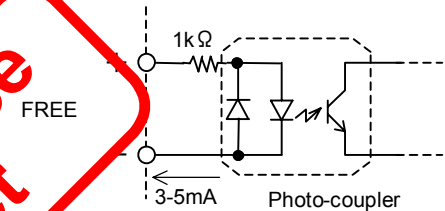
Clock Inputs (CW/CLK, CCW/UD)



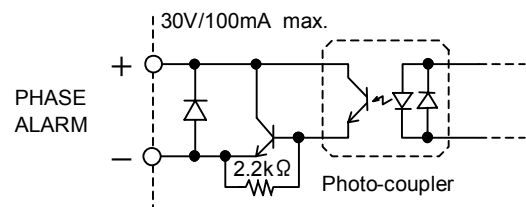
Clock Pulse Specification



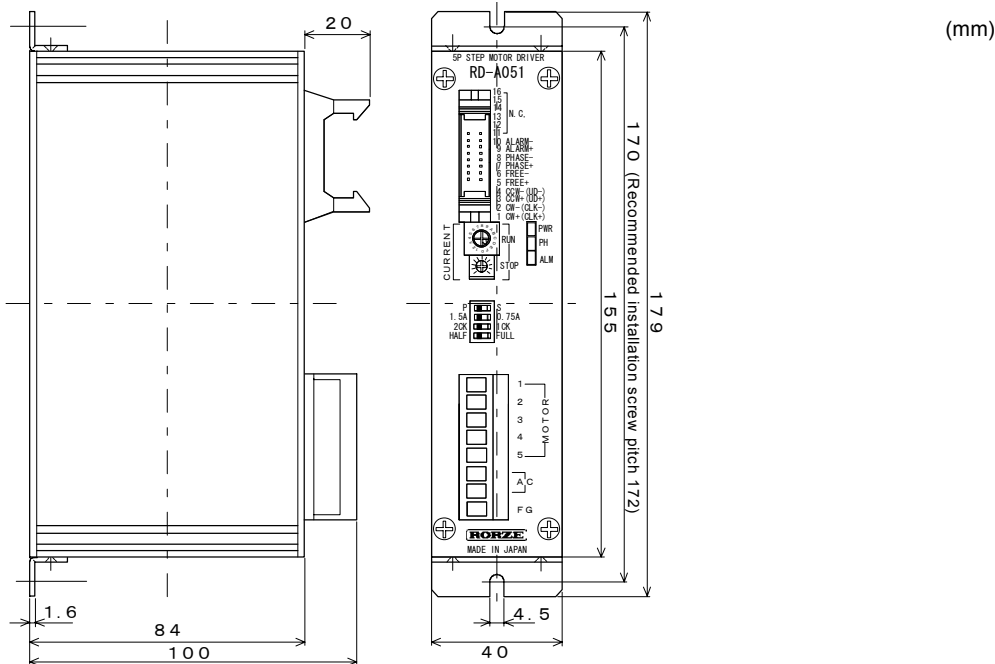
Input Circuits



Output Circuits



Dimensions



Built-in oscillator

5-PH Stepping Motor Driver

RD-153A



Features

- Built-in pulse oscillator
- Can set RPM 16steps by SPEED terminals
- FREE input to turn off excitation current of a motor
- PHASE OUT output for location of home for excitation timing
- Auto. current down

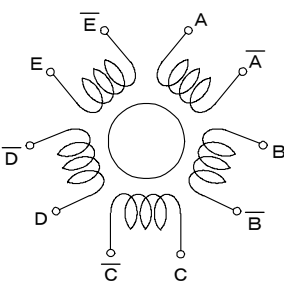
Specifications

Supply voltage	18 to 40VDC (including ripple)
Supply current	Approx. 2times rated coil current of motor (max.)
Motor current	0.5 to 3A/phase
Drive method	Bipolar, constant current chopper method
Excitation method	Full step (4P) or Half step (4-5P)
Auto. current down	50% of the rated current after about 0.3 seconds of inactivity
Oscillating frequency	55kpps max.
Speed change function	Digital (16divisions by ABCD terminals)
Accel./Decel. time	15msec to 1,500msec
Protective circuitry	Overheating, over current, & low voltage protection
Outside dimensions	63(H) × 56(W) × 105(D)mm
Weight	Approx. 580g

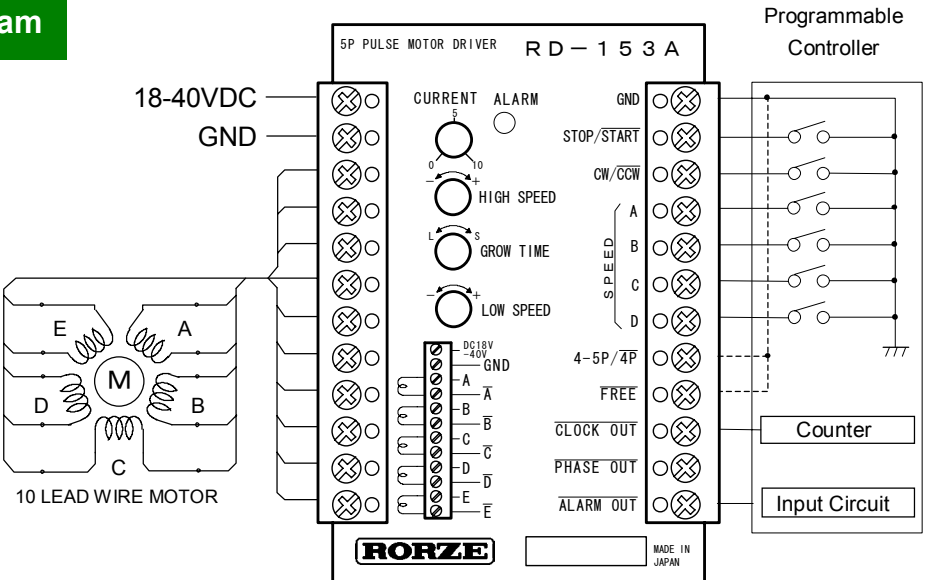
Suitable motors

Manufacturer	Model No.
RORZE Co.	RM5000 series
OTHER	HB type (PM type) 5-ph stepping motor (10 lead wires)

Motor Wiring



Wiring Diagram



Functions

STOP/START (Input)

Turning STOP/START input to Low level (connecting to GND potential) will make the motor start to run. Turning STOP/START input to High level (open) will make the motor stop.

CW/CCW (Input)

Turning CW/CCW to Low level (connecting to GND potential) will make the motor rotate in CCW direction. Turning CW/CCW to High level (open) will make the motor rotate in CW direction.

SPEED A. B. C. D (Input)

These input terminals are used for setting RPM. 16 speeds are available between the highest and the lowest rpm setting by combination of signals from SPEED terminal ABCD.

4-5P/4P (Input)

Motor rotates with 4-5phase excitation (half step) when this terminal is High level (open) and with 4-phase excitation (Full step) when Low level (connecting to GND potential).

FREE (Input)

Stepping motor drive current turns OFF at Low level (connects to GND potential) and the motor shaft can be rotated by hand. When turning FREE input to High level (open) again, the motor is excited at the phase home.

CLOCK OUT (Output)

Terminal to output clock pulses. One pulse is put out every time a motor rotates one step. Low level time is fixed to 5 μ sec.

PHASE OUT (Output)

PHASE OUT output is turned ON at the phase home. Once every 10 steps in full step operation (or once every 20 steps in half step), one pulse is put out.

ALARM OUT (Output)

When the internal temperature of the driver reaches 75°C, ALARM OUT output is turned ON and ALARM LED will light. Also, a motor will stop and auto. current down will work. If the body temperature drops about 15°C below the triggered temperature, returns automatically.

ALARM LED

This will light when Overheating protection circuit is in operation.

Current Adjustment Trimmer

Trimmer to adjust the drive current.

Grow Time Trimmer

Trimmer to set the acceleration and deceleration time. Adjustable range is from 15msec to 1,500 msec.

High Speed Trimmer

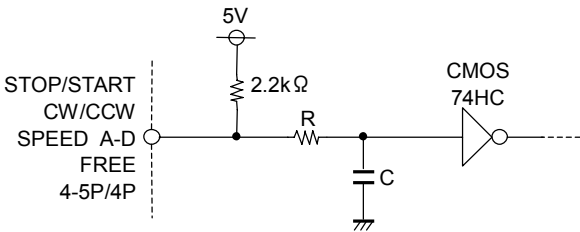
This trimmer is used for setting the high speed.

Low Speed Trimmer

This trimmer is used for setting the low speed.

Circuits

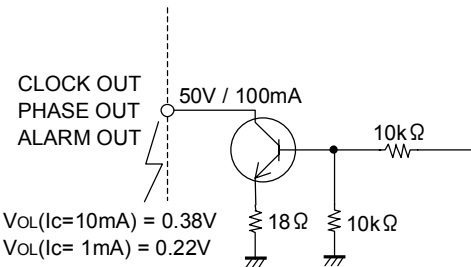
Input Circuits



Low Level: Less than 1.5V (Provided FREE is less than 0.8V)
High Level: More than 3.5V

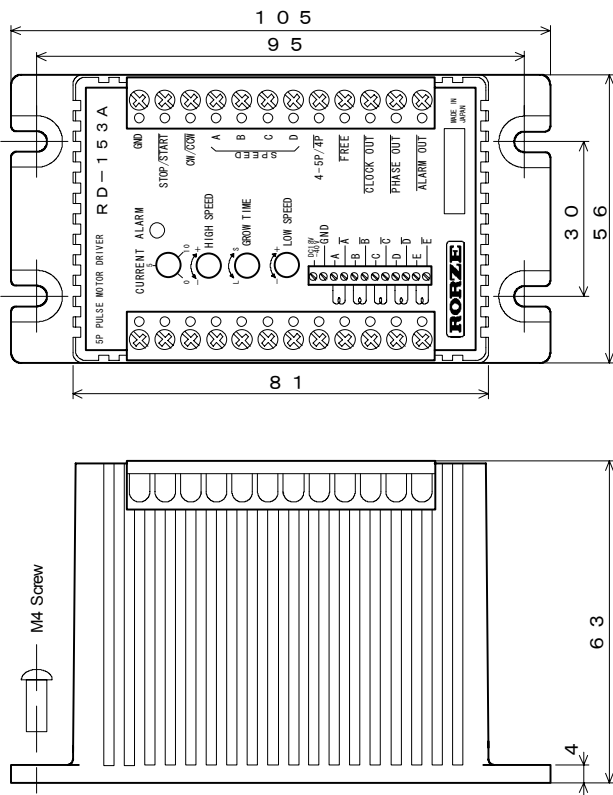
Terminal	R	C
STOP/START	10k Ω	1000pF
CW/CCW	2.2k Ω	1000pF
FREE	10 k Ω	None
SPEED A-D	10 k Ω	None

Output Circuits



$V_{OL}(I_C=10mA) = 0.38V$
 $V_{OL}(I_C=1mA) = 0.22V$

Dimensions



5-PH Stepping Motor Driver

RD-353A



Features

- Built-in pulse oscillator
- Can set RPM by analog voltage of SPEED terminal
- FREE input to turn off excitation current of a motor
- PHASE OUT output for location of home for excitation timing
- Auto. current down

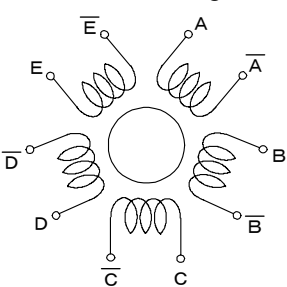
Specifications

Supply voltage	18 to 40VDC (including ripple)
Supply current	Approx. 2times rated coil current of motor (max.)
Motor current	0.5 to 3A/phase
Drive method	Bipolar, constant current chopper method
Excitation method	Full step (4P) or Half step (4-5P)
Auto. current down	50% of the rated current after about 0.3 seconds of inactivity
Oscillating frequency	70kpps max.
Speed change function	Analog (Variable by analog voltage of SPEED terminal)
Accel./Decel. time	20msec to 3sec
Protective circuitry	Overheating, over current, & low voltage protection
Outside dimensions	63(H) × 56(W) × 105(D)mm
Weight	approx. 580g

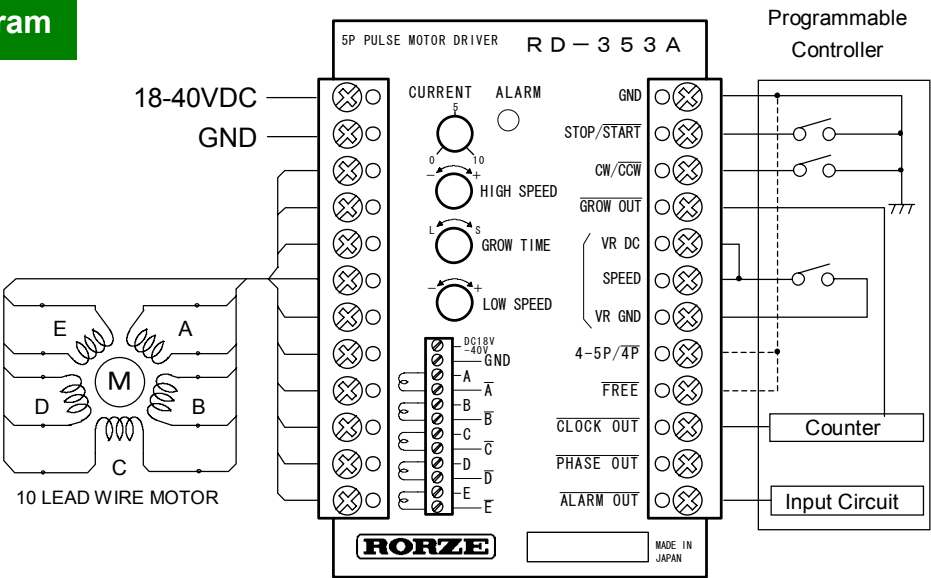
Suitable motors

Manufacturer	Model No.
RORZE Co.	RM5000 series
OTHER	HB type (PM type) 5-ph stepping motor (10 lead wires)

Motor Wiring



Wiring Diagram



Functions

STOP/START (Input)

Turning STOP/START input to Low level (connecting to GND potential) will make the motor start to run.
Turning STOP/START input to High level (open) will make the motor stop.

CW/CCW (Input)

Turning CW/CCW to Low level (connecting to GND potential) will make the motor rotate in CCW direction.
Turning CW/CCW to High level (open) will make the motor rotate in CW direction.

GROW OUT (Output)

GROW OUT output is turned ON when the motor changes from a stationary state to the speed set at High Speed trimmer.
Therefore, by using the number of pulses from acceleration to GROW OUT output duration, it is possible to calculate deceleration time.
This feature makes the driver control only by setting total pulse using RC-204A/207A and RC-410.

VR DC (Output)

This output is used for supplying voltage to SPEED input.
The output is maintained at 9V with a 4.7kΩ pull-up resistor.

SPEED (Input)

This input is used for changing speed. By changing the SPEED input voltage from the voltage at VR GND (0V) to output voltage of VR DC (9V), you can adjust the frequency between the lowest and highest voltage set at Low Speed trimmer and High Speed trimmer.

VR GND

Use VR GND along with SPEED input for remote speed control.
As a good practice, use a shielded wire.

4-5P/4P (Input)

Motor rotates with 4-5phase excitation (half step) when this terminal is High level (open) and with 4-phase excitation (Full step) when Low level (connecting to GND potential).

FREE (Input)

Stepping motor drive current turns OFF at Low level (connects to GND potential) and the motor shaft can be rotated by hand.
When turning FREE input to High level (open) again, the motor is excited at the phase home.

CLOCK OUT (Output)

Terminal to output clock pulses. One pulse is put out every time a motor rotates one step.
The duty of output clock pulse is approx. 50%.

PHASE OUT (Output)

PHASE OUT output is turned ON at the phase home.
Once every 10 steps in full step operation (or once every 20 steps in half step), one pulse is put out.

ALARM OUT (Output)

When the internal temperature of the driver reaches 75°C, ALARM OUT output is turned ON and ALARM LED will light.
Also, a motor will stop and auto. current down will work.
If the body temperature drops about 15°C below the triggered temperature, returns automatically.

ALARM LED

This will light when Overheating protection circuit is in operation.

Current Adjustment Trimmer

Trimmer to adjust the drive current.

Grow Time Trimmer

Trimmer to set the acceleration and deceleration time.
Adjustable range is from 20msec to 3sec.

High Speed Trimmer

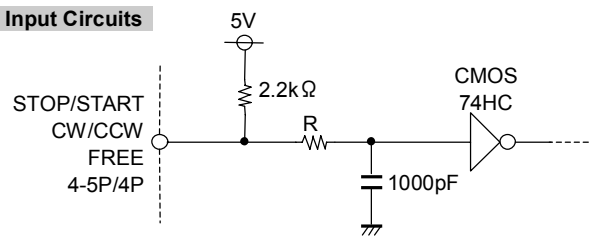
This trimmer is used for setting the high speed.

Low Speed Trimmer

This trimmer is used for setting the low speed.

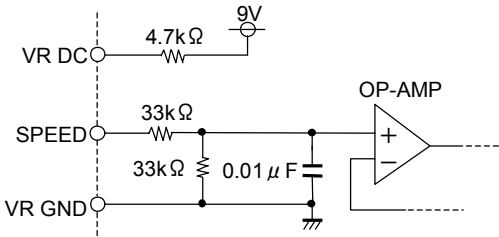
Circuits

Input Circuits

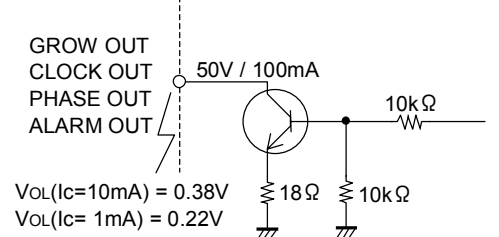


Low Level: Less than 1.5V (Provided FREE is less than 0.8V)
High Level: More than 3.5V

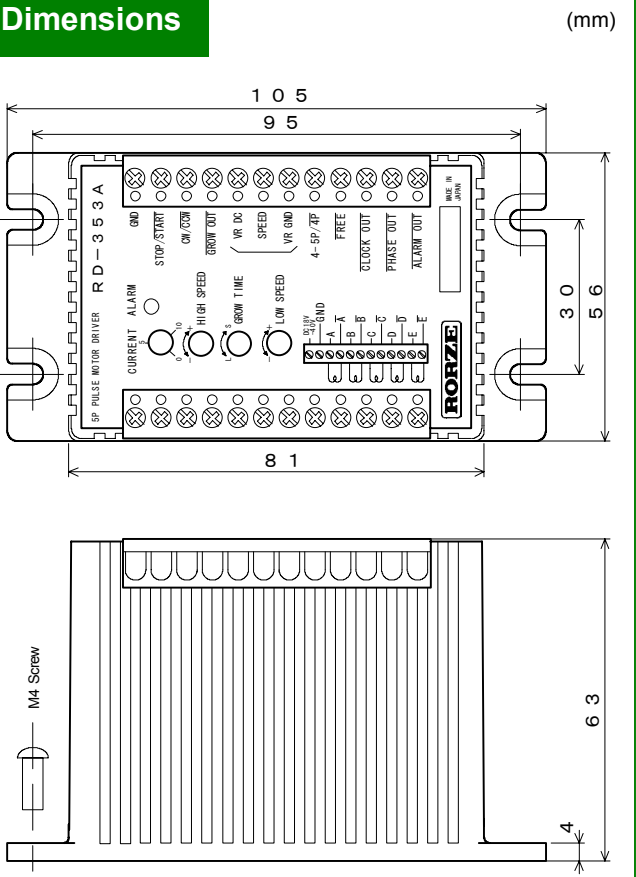
Terminal	R
STOP/START	10kΩ
CW/CCW	
FREE	2.2kΩ
4-5P/4P	



Output Circuits



Dimensions



Smooth & Powerful

RM series Stepping Motors

Specifications

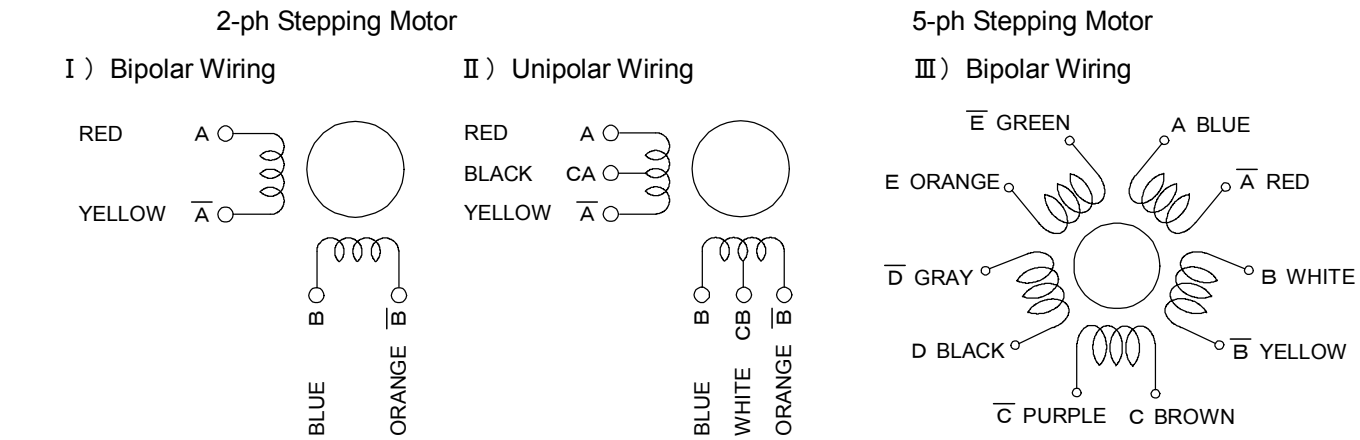
RORZE 2-ph Stepping Motors

Model No.	Holding Torque (N·m)	FullStep Angle (Degree)	Rated Current (A/ph)	Rotor Inertia (kg·m ²)	Resistance (Ω)	Inductance (mH)	Weight (g)	Wiring
RM2C5648-30S/D	0.47	3.75	3.0	150 × 10 ⁻⁷	0.74	1.35	540	I
RM2C5675-60S/D	1.03	3.75	6.0	330 × 10 ⁻⁷	0.27	0.75	1000	I
RM2414S/D	0.14	1.8	1.5	30 × 10 ⁻⁷	1.3	0.96	200	II
RM2424S/D	0.24	1.8	1.5	53 × 10 ⁻⁷	1.75	2.2	285	II
RM2621S/D	0.21	1.8	3.0	57 × 10 ⁻⁷	0.36	0.48	350	II
RM2640S/D	0.39	1.8	3.0	100 × 10 ⁻⁷	0.6	0.8	470	II
RM2690S/D	0.78	1.8	3.0	210 × 10 ⁻⁷	0.77	1.58	650	II
RM26A3S/D	1.3	1.8	3.0	360 × 10 ⁻⁷	0.9	2.2	1000	II
RM29A3S/D	1.3	1.8	6.0	560 × 10 ⁻⁷	0.24	0.7	1350	II
RM29B2S/D	2.2	1.8	6.0	1100 × 10 ⁻⁷	0.32	1.2	2400	II

RORZE 5-ph Stepping Motors

Model No.	Holding Torque (N·m)	FullStep Angle (Degree)	Rated Current (A/ph)	Rotor Inertia (kg·m ²)	Resistance (Ω)	Inductance (mH)	Weight (g)	Wiring
RM5407SM/DM	0.074	0.36	1.5	18.2 × 10 ⁻⁷	0.6	0.45	200	III
RM5411SM/DM	0.11	0.36	1.5	24 × 10 ⁻⁷	0.65	0.93	230	III
RM5414SM/DM	0.14	0.36	1.5	36 × 10 ⁻⁷	0.89	0.87	300	III
RM5623S/D	0.23	0.72	3.0	57 × 10 ⁻⁷	0.19	0.25	400	III
RM5640S/D	0.39	0.72	3.0	105 × 10 ⁻⁷	0.24	0.37	600	III
RM5685S/D	0.83	0.72	3.0	235 × 10 ⁻⁷	0.46	1.16	1100	III
RM59A2S/D	1.23	0.72	3.0	520 × 10 ⁻⁷	0.33	2.0	1500	III
RM59B2S/D	2.2	0.72	3.0	1200 × 10 ⁻⁷	0.36	2.5	2500	III
RM59D0S/D	3.9	0.72	3.0	1800 × 10 ⁻⁷	0.66	5.4	3650	III

Color of Motor wire and Wiring Diagram



2-PH Stepping Motor
RM2C5648-30S
RM2C5648-30D

3.75 ° Step angle

Torque Chart

Specifications

RM2C5648-30S	Single Shaft
RM2C5648-30D	Double Shaft
Motor torque (N·m)	0.47
Current (A/Phase)	3.0
Rotor inertia (kg·m ²)	150 × 10 ⁻⁷
Allowable radial load (N)	75
Allowable thrust load (N)	15

※The load point is the shaft edge.

Dimensions

2-PH Stepping Motor
RM2C5675-60S
RM2C5675-60D

3.75 ° Step angle

Torque Chart

Torque Chart

RM2C5675-60S	Single Shaft
RM2C5675-60D	Double Shaft
Motor torque (N·m)	1.03
Current (A/Phase)	6.0
Rotor inertia (kg·m ²)	330 × 10 ⁻⁷
Allowable radial load (N)	65
Allowable thrust load (N)	15

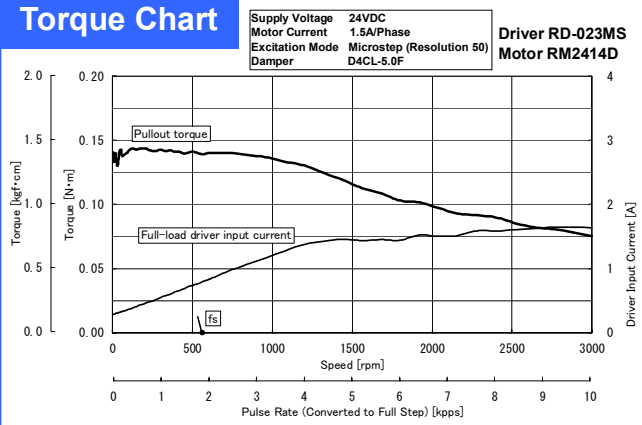
※The load point is the shaft edge.

Dimensions

2-PH Stepping Motor
RM2414S
RM2414D

1.8° Step angle

Torque Chart



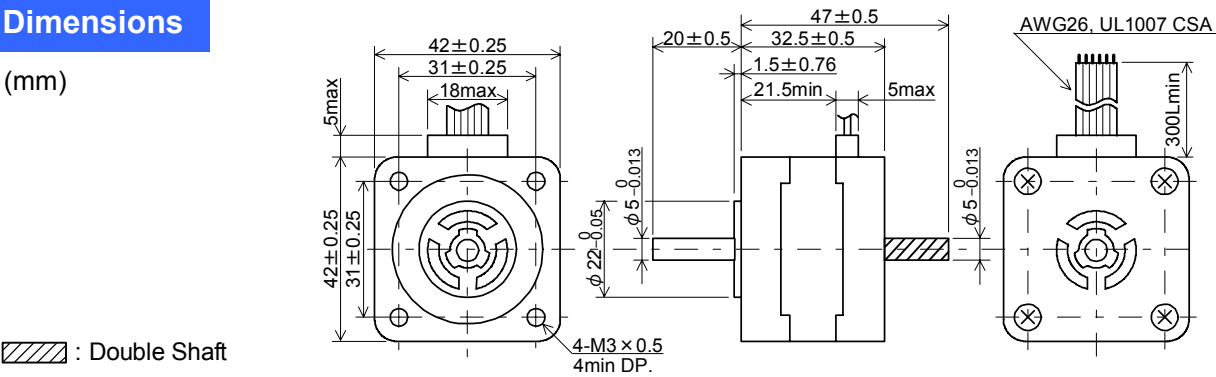
Specifications

RM2414S	Single Shaft
RM2414D	Double Shaft
Motor torque	(N·m) 0.14
Current	(A/Phase) 1.5
Rotor inertia	(kg·m ²) 30×10^{-7}
Allowable radial load	(N) 35
Allowable thrust load	(N) 10

※The load point is the position of 1/3 from the shaft edge.

Dimensions

(mm)

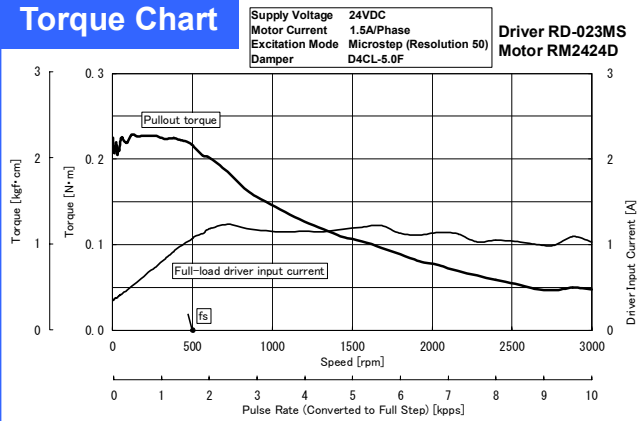


Double Shaft

2-PH Stepping Motor
RM2424S
RM2424D

1.8° Step angle

Torque Chart



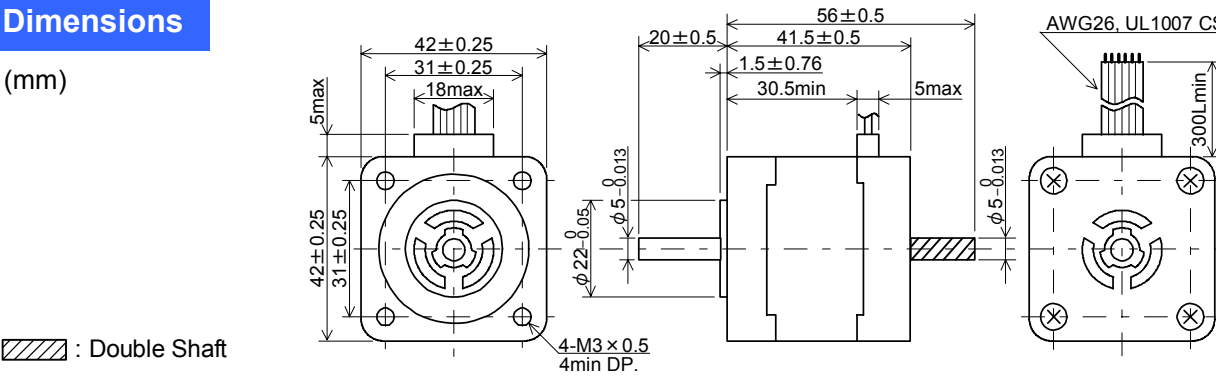
Specifications

RM2424S	Single Shaft
RM2424D	Double Shaft
Motor torque	(N·m) 0.24
Current	(A/Phase) 1.5
Rotor inertia	(kg·m ²) 53×10^{-7}
Allowable radial load	(N) 35
Allowable thrust load	(N) 10

※The load point is the position of 1/3 from the shaft edge.

Dimensions

(mm)

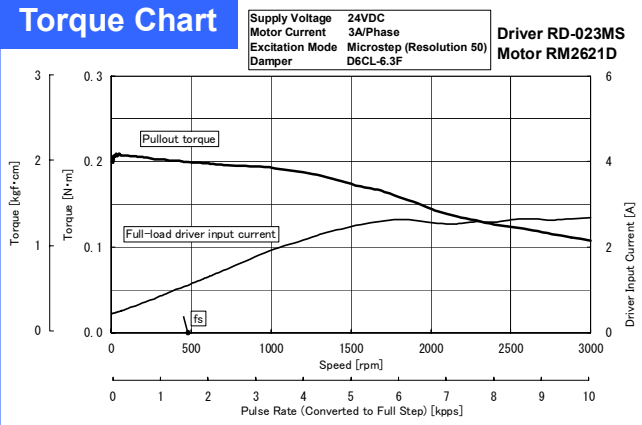


Double Shaft

2-PH Stepping Motor
RM2621S
RM2621D

1.8° Step angle

Torque Chart



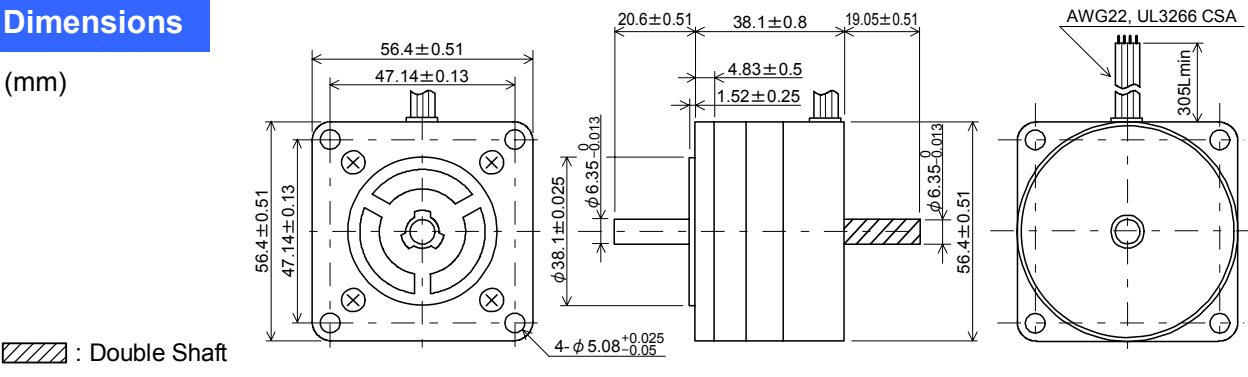
Specifications

RM2621S	Single Shaft
RM2621D	Double Shaft
Motor torque	(N·m) 0.21
Current	(A/Phase) 3.0
Rotor inertia	(kg·m ²) 57×10^{-7}
Allowable radial load	(N) 105
Allowable thrust load	(N) 15

※The load point is the position of 1/3 from the shaft edge.

Dimensions

(mm)

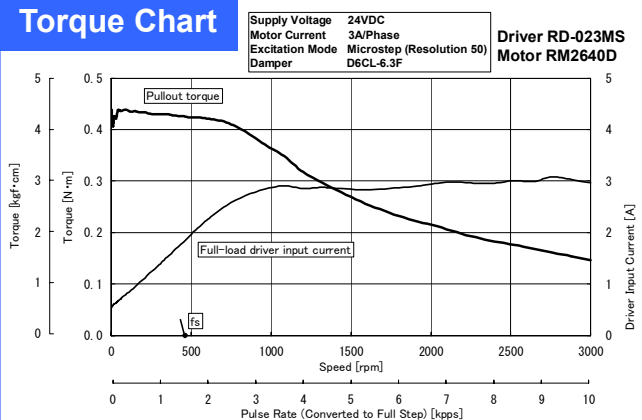


Double Shaft

2-PH Stepping Motor
RM2640S
RM2640D

1.8° Step angle

Torque Chart



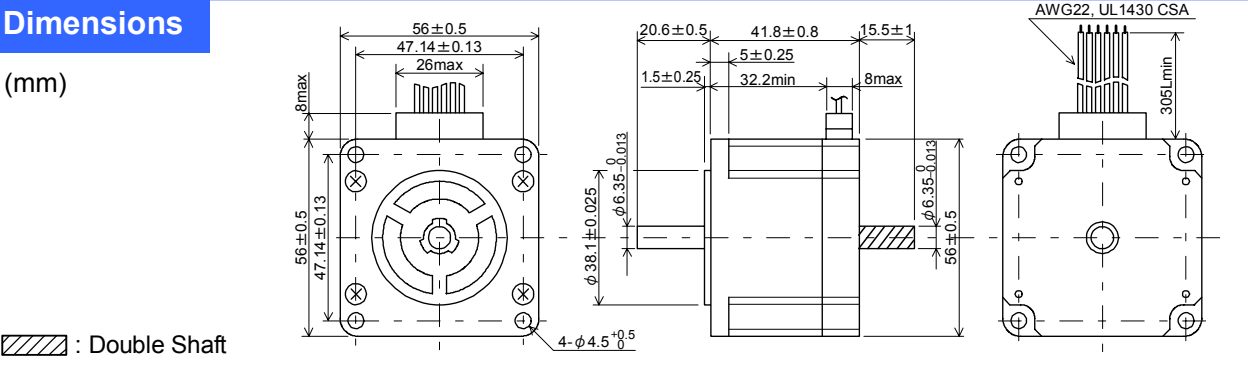
Specifications

RM2640S	Single Shaft
RM2640D	Double Shaft
Motor torque	(N·m) 0.39
Current	(A/Phase) 3.0
Rotor inertia	(kg·m ²) 360×10^{-7}
Allowable radial load	(N) 75
Allowable thrust load	(N) 15

※The load point is the position of 1/3 from the shaft edge.

Dimensions

(mm)



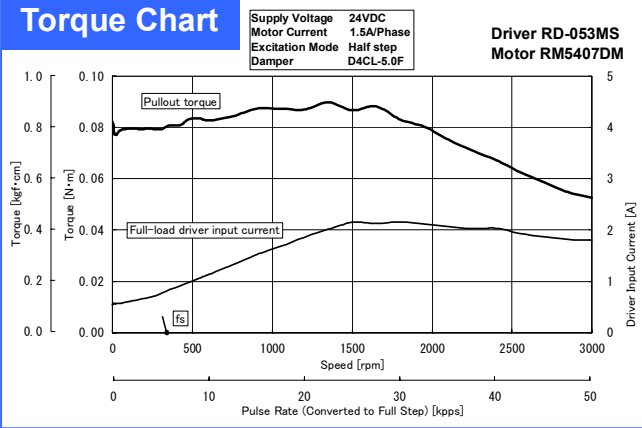
Double Shaft

5-PH Stepping Motor

RM5407SM
RM5407DM

0.36 ° Step angle

Torque Chart



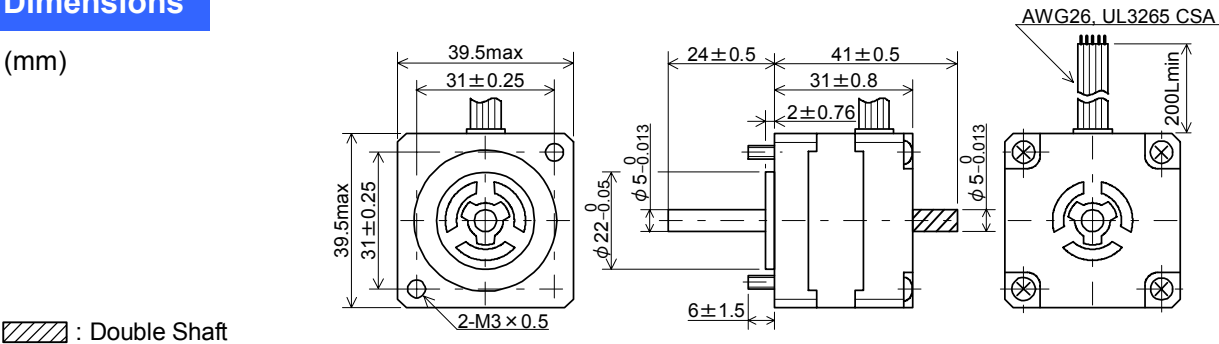
Specifications

RM5407SM	Single Shaft
RM5407DM	Double Shaft
Motor torque	(N·m) 0.074
Current	(A/Phase) 1.5
Rotor inertia	(kg·m ²) 18.2×10^{-7}
Allowable radial load	(N) 35
Allowable thrust load	(N) 10

※The load point is the position of 1/3 from the shaft edge.

Dimensions

(mm)



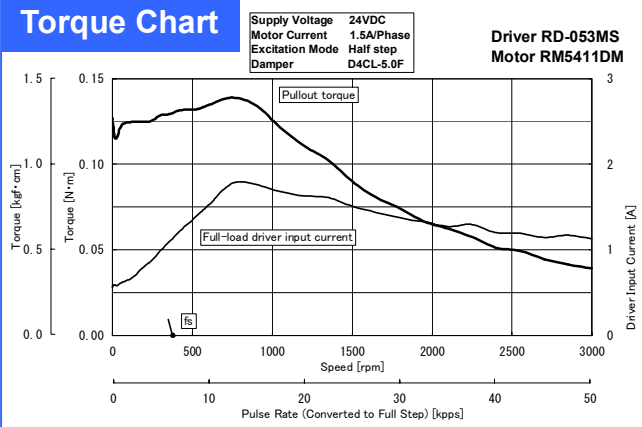
Double Shaft

5-PH Stepping Motor

RM5411SM
RM5411DM

0.36 ° Step angle

Torque Chart



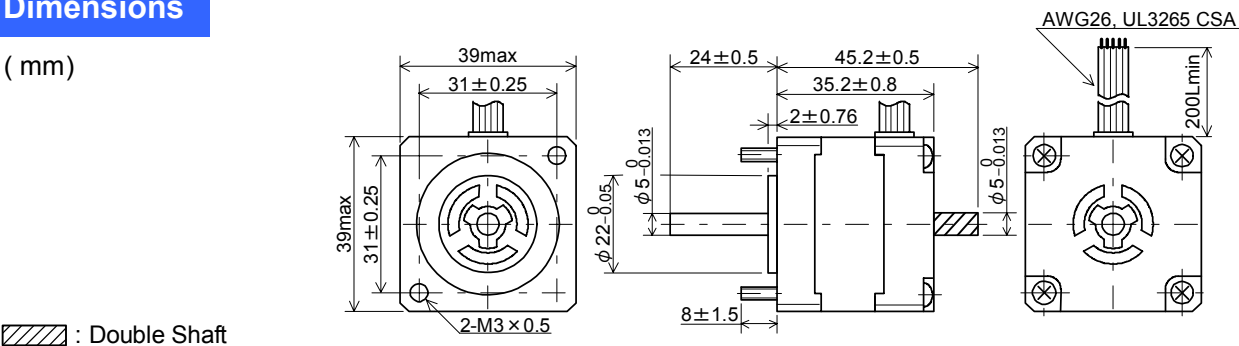
Specifications

RM5411SM	Single Shaft
RM5411DM	Double Shaft
Motor torque	(N·m) 0.11
Current	(A/Phase) 1.5
Rotor inertia	(kg·m ²) 24×10^{-7}
Allowable radial load	(N) 35
Allowable thrust load	(N) 10

※The load point is the position of 1/3 from the shaft edge.

Dimensions

(mm)



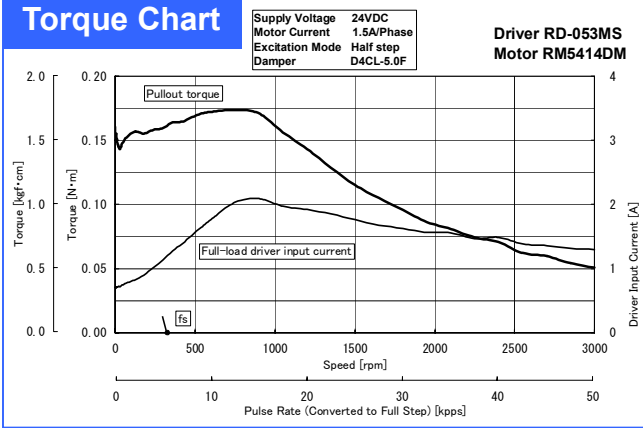
Double Shaft

5-PH Stepping Motor

RM5414SM
RM5414DM

0.36 ° Step angle

Torque Chart



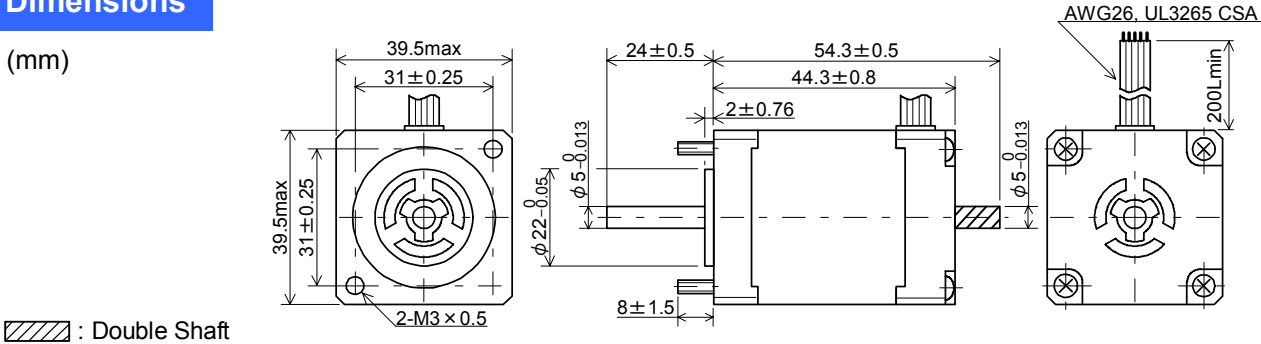
Specifications

RM5414SM	Single Shaft
RM5414DM	Double Shaft
Motor torque	(N·m) 0.14
Current	(A/Phase) 1.5
Rotor inertia	(kg·m ²) 36×10^{-7}
Allowable radial load	(N) 35
Allowable thrust load	(N) 10

※The load point is the position of 1/3 from the shaft edge.

Dimensions

(mm)



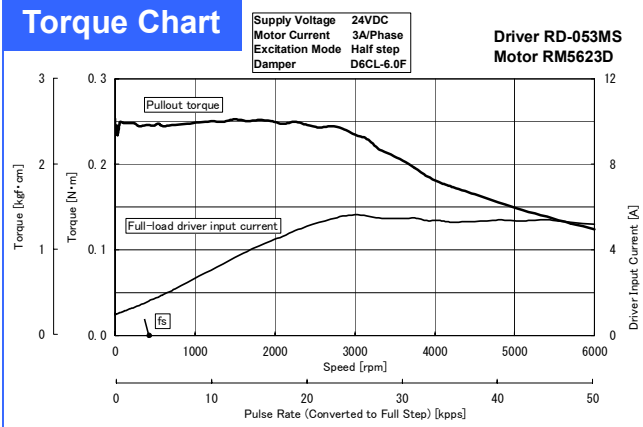
Double Shaft

5-PH Stepping Motor

RM5623S
RM5623D

0.72 ° Step angle

Torque Chart



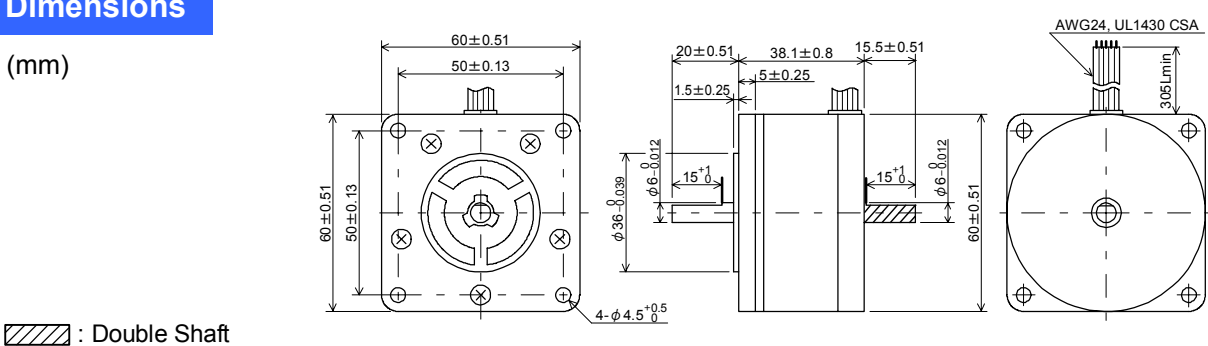
Specifications

RM5623S	Single Shaft
RM5623D	Double Shaft
Motor torque	(N·m) 0.23
Current	(A/Phase) 3.0
Rotor inertia	(kg·m ²) 57×10^{-7}
Allowable radial load	(N) 105
Allowable thrust load	(N) 15

※The load point is the position of 1/3 from the shaft edge.

Dimensions

(mm)

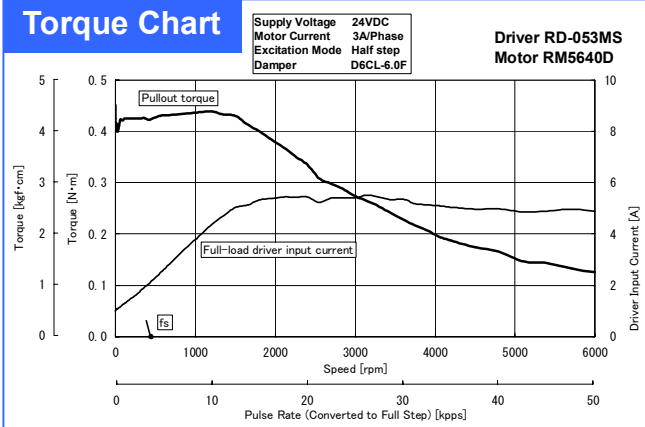


Double Shaft

5-PH Stepping Motor
RM5640S
RM5640D

0.72 ° Step angle

Torque Chart



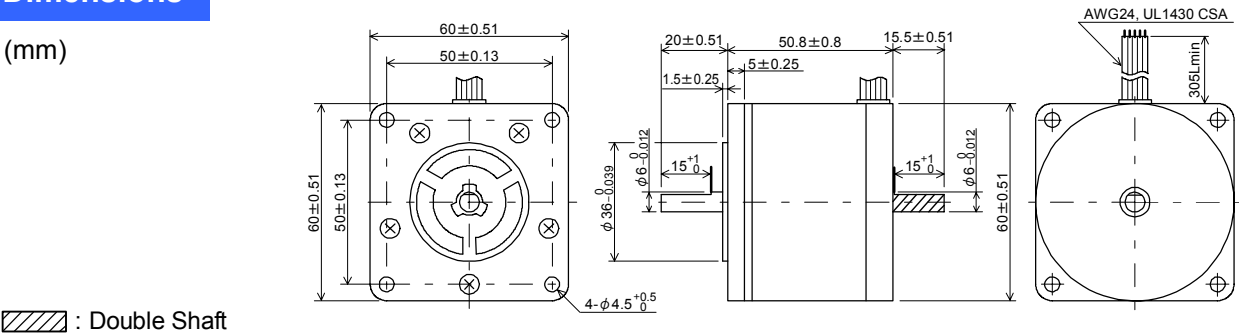
Specifications

RM5640S	Single Shaft
RM5640D	Double Shaft
Motor torque	(N·m) 0.39
Current	(A/Phase) 3.0
Rotor inertia	(kg·m ²) 105×10^{-7}
Allowable radial load	(N) 105
Allowable thrust load	(N) 15

※The load point is the position of 1/3 from the shaft edge.

Dimensions

(mm)

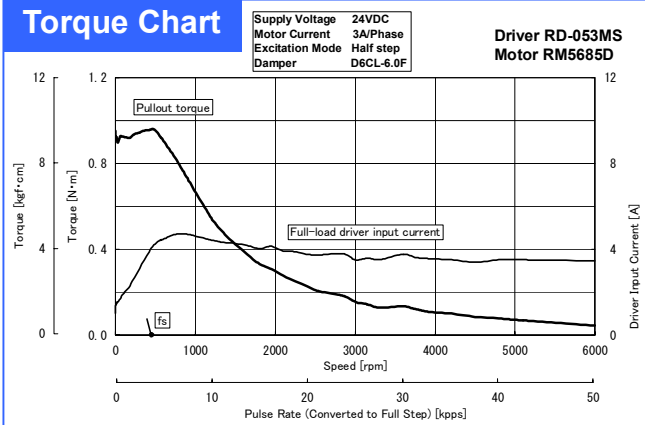


Double Shaft

5-PH Stepping Motor
RM5685S
RM5685D

0.72 ° Step angle

Torque Chart



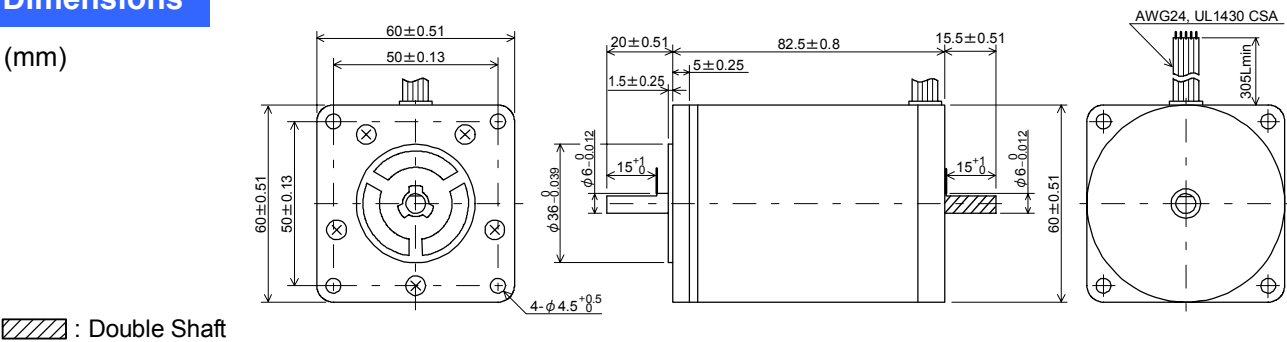
Specifications

RM5685S	Single Shaft
RM5685D	Double Shaft
Motor torque	(N·m) 0.83
Current	(A/Phase) 3.0
Rotor inertia	(kg·m ²) 235×10^{-7}
Allowable radial load	(N) 105
Allowable thrust load	(N) 15

※The load point is the position of 1/3 from the shaft edge.

Dimensions

(mm)

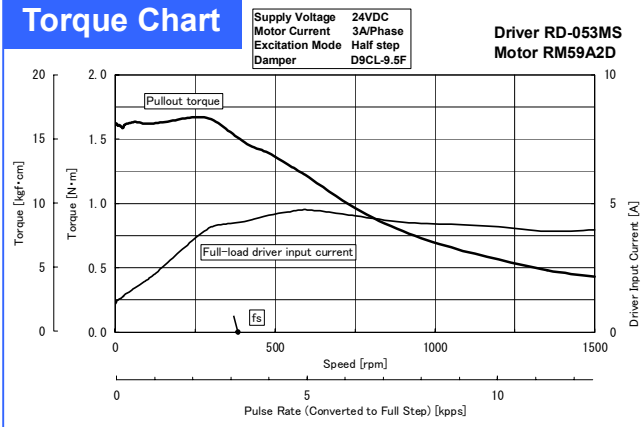


Double Shaft

5-PH Stepping Motor
RM59A2S
RM59A2D

0.72 ° Step angle

Torque Chart



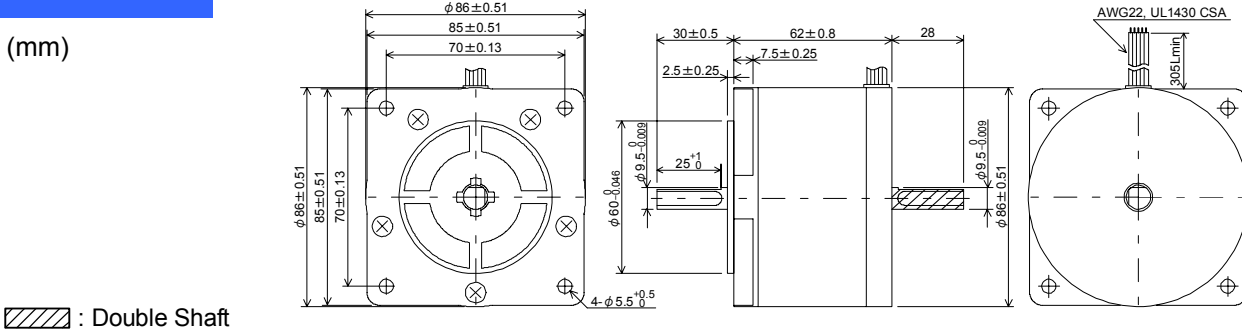
Specifications

RM59A2S	Single Shaft
RM59A2D	Double Shaft
Motor torque	(N·m) 1.23
Current	(A/Phase) 3.0
Rotor inertia	(kg·m ²) 520×10^{-7}
Allowable radial load	(N) 130
Allowable thrust load	(N) 60

※The load point is the position of 1/3 from the shaft edge.

Dimensions

(mm)

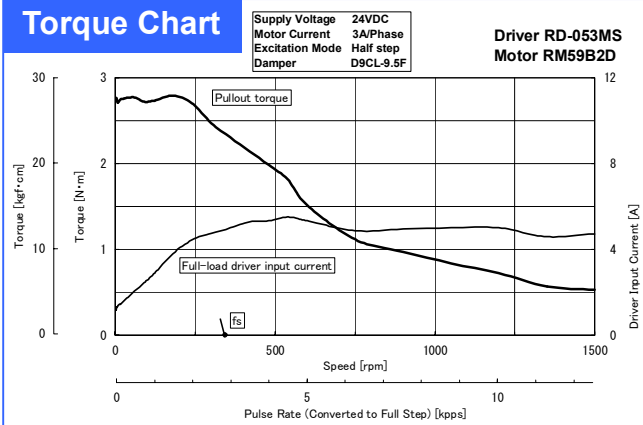


Double Shaft

5-PH Stepping Motor
RM59B2S
RM59B2D

0.72 ° Step angle

Torque Chart



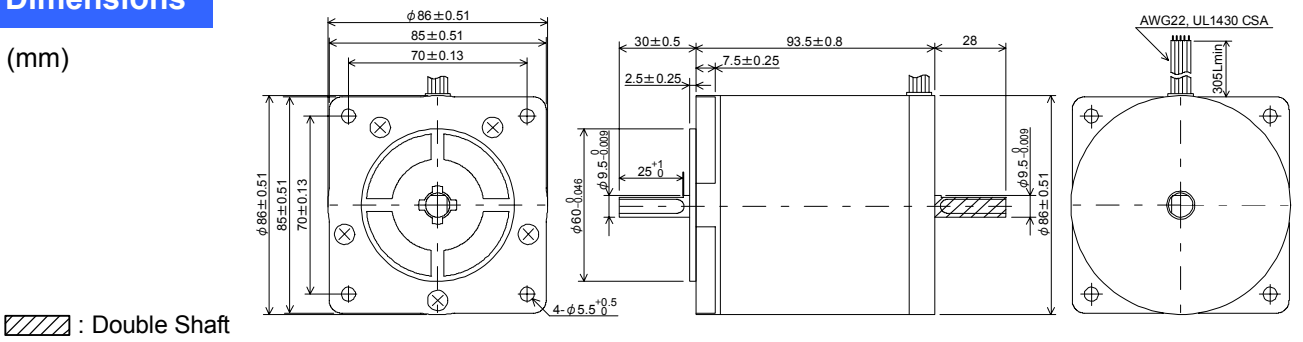
Specifications

RM59B2S	Single Shaft
RM59B2D	Double Shaft
Motor torque	(N·m) 2.2
Current	(A/Phase) 3.0
Rotor inertia	(kg·m ²) 1200×10^{-7}
Allowable radial load	(N) 200
Allowable thrust load	(N) 60

※The load point is the position of 1/3 from the shaft edge.

Dimensions

(mm)

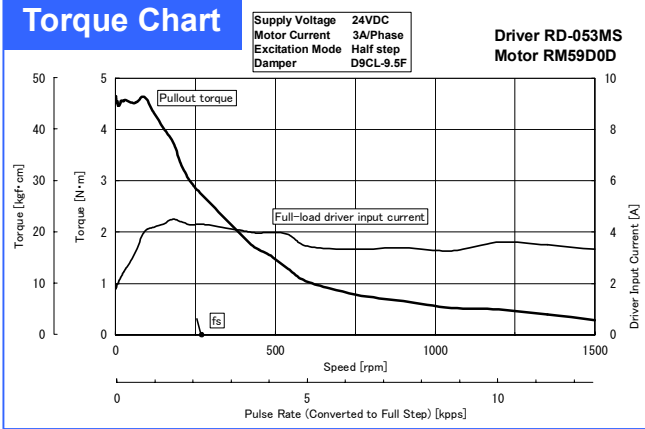


Double Shaft

5-PH Stepping Motor
RM59D0S
RM59D0D

0.72 ° Step angle

Torque Chart



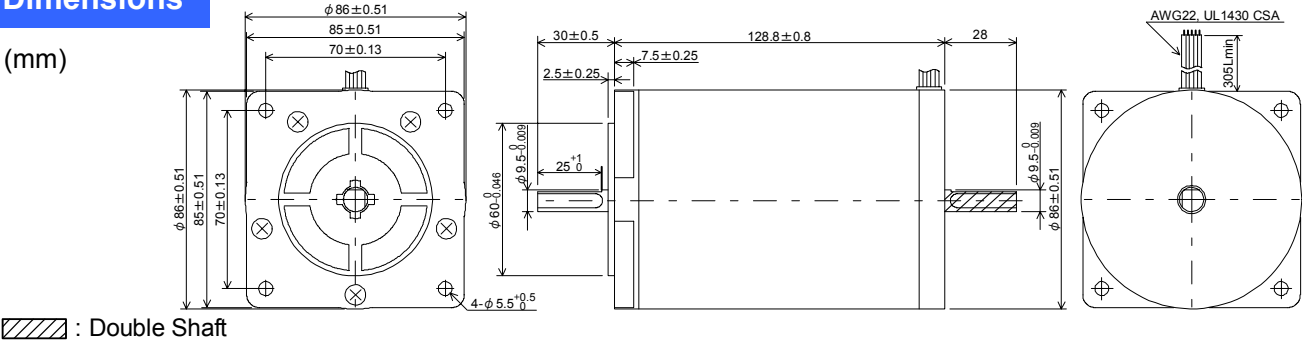
Specifications

RM59D0S Single Shaft		
RM59D0D Double Shaft		
Motor torque	(N·m)	3.9
Current	(A/Phase)	3.0
Rotor inertia	(kg·m ²)	1800 × 10 ⁻⁷
Allowable radial load	(N)	200
Allowable thrust load	(N)	60

※The load point is the position of 1/3 from the shaft edge.

Dimensions

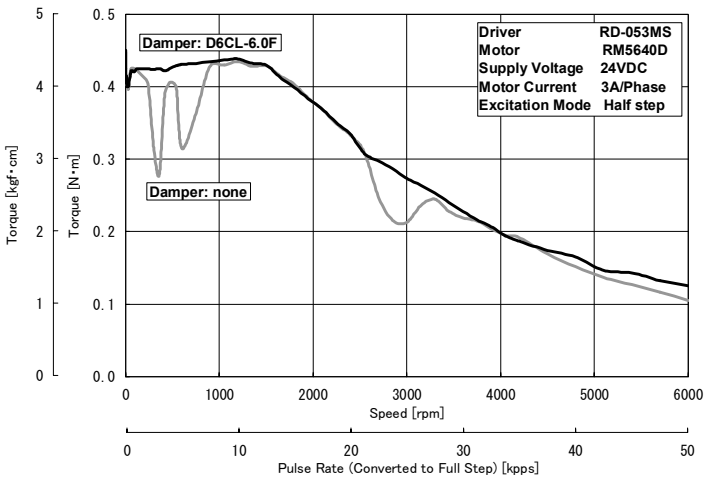
(mm)



Double Shaft



Recommended Damper



The stepping motor has the characteristic that it resonates or vibrates greatly at a certain number of rotations. Moreover, it also generates the fall of the torque by resonance/vibration.

If you use a micro step driver, you can control resonance in a low-speed region. Furthermore, attaching a damper to the motor enables the reduction of vibration in all speed region and the improvement of high-speed characteristic.

Motor	Recommended Damper (Manufactured by ORIENTAL MOTOR)
RM2C5648-30D RM2C5675-60D	D6CL-6.3F
RM2414D RM2424D	D4CL-5.0F
RM2621D RM2640D RM2690D RM26A3D	D6CL-6.3F
RM29A3D RM29B2D	D9CL-9.5AF
RM5407DM RM5411DM RM5414DM	D4CL-5.0F
RM5623D RM5640D RM5685D	D6CL-6.0F
RM59A2D RM59B2D RM59D0D	D9CL-9.5F

※When you attach a damper to a motor's axle, please use a double shaft motor.

Productions to be discontinued

Information for our products to be discontinued

Controllers

Products to be discontinued	Discontinuance time	Recommended replacements
RC-201	Mar. 1997	RC-203A
RC-203		
RC-202	Mar. 1997	RC-204A
RC-204	Jan. 1991	
RC-207	Jan. 1994	RC-207A
RC-231(HA)	Dec. 2004	RC-234
RC-233		

We had discontinued to produce the above controllers because of discontinuance of components.

Drivers

Products to be discontinued	Discontinuance time	Recommended replacements
RD-022(N)	Dec. 2006	RD-022(N)A
RD-023(N)	Oct. 2005	RD-023(N)A
RD-023H(N)	Mar. 1998	RD-023MSH
RD-023M10(N)		
RD-023M50(N)		
RD-023M10H(N)		
RD-023M50H(N)		
RD-026(N)	Apr. 1998	RD-026MSA
RD-026M10(N)		
RD-026M50(N)		
RD-026MS	Dec. 1999	
RD-122	Dec. 2006	RD-122A
RD-123	Oct. 2005	RD-123A
RD-126		RD-126A
RD-123H	Oct. 2005	-
RD-323	Oct. 2005	RD-323A
RD-326		RD-326A
RD-323H	Oct. 2005	RD-323M10HA RD-323M50HA
RD-323M10		
RD-323M50		
RD-323M10H RD-323M50H		
RD-326M10 RD-326M50	Oct. 2005	RD-326M10A RD-326M50A
RD-053(N)	Oct. 2005	RD-053(N)A
RD-153	Oct. 2005	RD-153A
RD-353	Oct. 2005	RD-353A

We had discontinued the above drivers because of launch of cost effective recommended replacements with higher performance.

Note: The replacements are compatible with the products to be discontinued, but please confirm the difference carefully since the wiring etc. may have been changed.

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